MAR 1 3 1990

I 72.12/2:89-0052/v.2

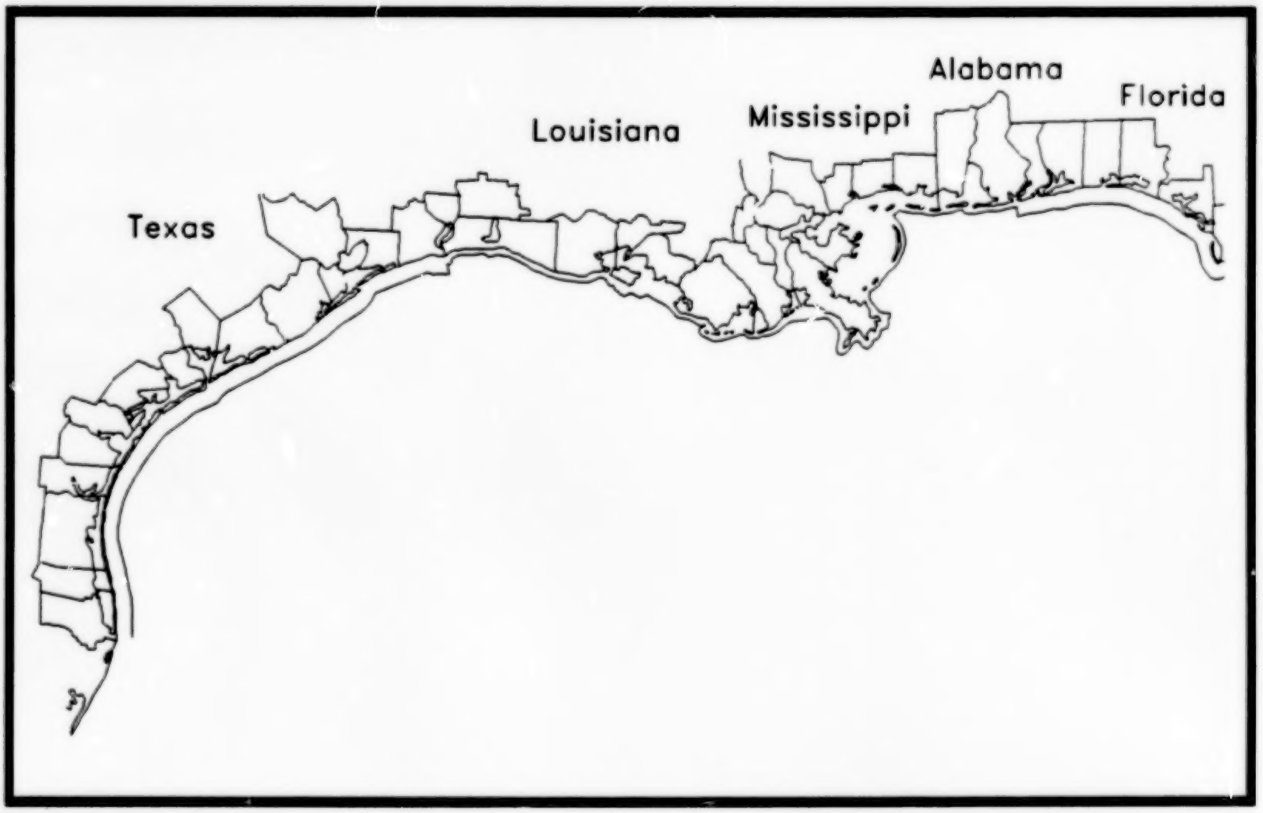
OCS Study
MMS 89-0052

An Analysis of Outer Continental Shelf Impacts

Pipelines, Navigation Channels, and Facilities in Sensitive Coastal Habitats

Coastal Gulf of Mexico

Volume II: Atlas of Physical, Cultural, and Biological Parameters



MMS
U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

OCS Study
MMS 89-0052

An Analysis of Outer Continental Shelf Impacts

Pipelines, Navigation Channels, and Facilities in Sensitive Coastal Habitats

Coastal Gulf of Mexico

Volume II: Atlas of Physical, Cultural, and Biological Parameters

Authors

Karen M. Wicker
Rod E. Emmer
Dave Roberts
J. van Beek

Prepared under MMS Contract
14-12-0001-30325
by
Coastal Environments, Inc.
1260 Main Street
Baton Rouge, Louisiana 70802

Published by

U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Regional Office

New Orleans
October 1989

DISCLAIMER

This report was prepared under contract between the Minerals Management Service (MMS) and Coastal Environments, Inc. This report has been technically reviewed by the MMS and approved for publication. Approval does not signify that contents necessarily reflect the views and policies of the Service, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. It is, however, exempt from review and compliance with MMS editorial standards.

REPORT AVAILABILITY

Extra copies of the report may be obtained from the Public Information Unit (Mail Stop OPS-3-4) at the following address:

U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Regional Office
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394

Attention: Public Information Unit (OPS-3-4)

(Telephone Number: (504) 736-2519)

CITATION

Suggested citation:

Wicker, K.M., R.E. Emmer, D. Roberts, and J. van Beek. 1989. Pipelines, Navigation Channels, and Facilities in Sensitive Coastal Habitats, An Analysis of Outer Continental Shelf Impacts, Coastal Gulf of Mexico. Volume II: Atlas of physical, cultural, and biological parameters. OCS Report/MMS 89-0052. U.S. Dept. of the Interior, Minerals Mgmt. Service, Gulf of Mexico OCS Regional Office, New Orleans, La. 83 pp.

TABLE OF CONTENTS

Page

Index to Maps v

Coastal Systems and Areas of Study vi

Map Series A

1-A Brownsville-Corpus Christi, TX: Location Map, Pipelines, and Facilities 2

2-A Corpus Christi-Beeville, TX: Location Map, Pipelines, and Facilities 3

3-A Bay City-Houston, TX: Location Map, Pipelines, and Facilities 4

4-A Houston, TX: Location Map, Pipelines, and Facilities 5

5-A Port Arthur, TX-LA: Location Map, Pipelines, and Facilities 6

6-A New Orleans, LA: Location Map, Pipelines, and Facilities 7

7-A Breton, LA: Location Map, Pipelines, and Facilities 8

8-A Mobile, AL: Location Map, Pipelines, and Facilities 9

9-A Pensacola, FL: Location Map, Pipelines, and Facilities 10

10-A Tallahassee, FL: Location Map Pipelines, and Facilities 11

Map Series B

1-B Brownsville-Corpus Christi, TX: Land Use and Navigation Channels 13

2-B Corpus Christi-Beeville, TX: Land Use and Navigation Channels 14

3-B Bay City-Houston, TX: Land Use and Navigation Channels 15

4-B Houston, TX: Land Use and Navigation Channels 16

5-B Port Arthur, TX-LA: Land Use and Navigation Channels 17

6-B New Orleans, LA: Land Use and Navigation Channels 18

7-B Breton, LA: Land Use and Navigation Channels 19

8-B Mobile, AL: Land Use and Navigation Channels 20

9-B Pensacola, FL: Land Use and Navigation Channels 21

10-B Tallahassee, FL: Land Use and Navigation Channels 22

Map Series C

1-C Brownsville-Corpus Christi, TX: Cultural Resources 24

2-C Corpus Christi-Beeville, TX: Cultural Resources 25

3-C Bay City-Houston, TX: Cultural Resources 26

4-C Houston, TX: Cultural Resources 27

5-C Port Arthur, TX: Cultural Resources 28

6-C New Orleans, LA: Cultural Resources 29

7-C Breton, LA: Cultural Resources 30

8-C Mobile, AL: Cultural Resources 31

9-C Pensacola, FL: Cultural Resources 32

10-C Tallahassee, FL: Cultural Resources 33

Map Series D

1-D Brownsville-Corpus Christi, TX: Vegetation, Precipitation Surplus, and Hydrology 35

2-D Corpus Christi-Beeville, TX: Vegetation, Precipitation Surplus, and Hydrology 36

3-D Bay City-Houston, TX: Vegetation, Precipitation Surplus, and Hydrology 37

4-D Houston, TX: Vegetation, Precipitation Surplus, and Hydrology 38

5-D Port Arthur, TX-LA: Vegetation, Precipitation Surplus, and Hydrology 39

6-D New Orleans, LA: Vegetation, Precipitation Surplus, and Hydrology 40

7-D Breton, LA: Vegetation, Precipitation Surplus, and Hydrology 41

8-D Mobile, AL: Vegetation, Precipitation Surplus, and Hydrology 42

9-D Pensacola, FL: Vegetation, Precipitation Surplus, and Hydrology 43

10-D Tallahassee, FL: Vegetation, Precipitation Surplus, and Hydrology 44

Map Series E

1-E Brownsville-Corpus Christi, TX: Shoreline Type, Depth to Pleistocene, and Sediment Transport 46

2-E Corpus Christi-Beeville, TX: Shoreline Type, Depth to Pleistocene, and Sediment Transport 47

3-E Bay City-Houston, TX: Shoreline Type, Depth to Pleistocene and Sediment Transport 48

4-E Houston, TX: Shoreline Type, Depth to Pleistocene, and Sediment Transport 49

5-E Port Arthur, TX-LA: Shoreline Type, Depth to Pleistocene, and Sediment Transport 50

6-E New Orleans, LA: Shoreline Type, Depth to Pleistocene, and Sediment Transport 51

7-E Breton, LA: Shoreline Type, Depth to Pleistocene, and Sediment Transport 52

8-E Mobile, AL: Shoreline Type, Depth to Pleistocene, and Sediment Transport 53

9-E Pensacola, FL: Shoreline Type, Depth to Pleistocene, and Sediment Transport 54

10-E Tallahassee, FL: Shoreline Type, Depth to Pleistocene, and Sediment Transport 55

Map Series F

1-F Brownsville-Corpus Christi, TX: Geomorphology and Shoreline Change 57

2-F Corpus Christi-Beeville, TX: Geomorphology and Shoreline Change 58

3-F Bay City-Houston, TX: Geomorphology and Shoreline Change 59

4-F Houston, TX: Geomorphology and Shoreline Change 60

5-F Port Arthur, TX: Geomorphology and Shoreline Change 61

6-F New Orleans, LA: Geomorphology and Shoreline Change 62

7-F Breton, LA: Geomorphology and Shoreline Change 63

8-F Mobile, AL: Geomorphology and Shoreline Change 64

9-F Pensacola, FL: Geomorphology and Shoreline Change 65

10-F Tallahassee, FL: Geomorphology and Shoreline Change 66

Map Series G

1-G Brownsville-Corpus Christi, TX: Nearshore Energy Levels 68

2-G Corpus Christi-Beeville, TX: Nearshore Energy Levels 69

3-G Bay City-Houston, TX: Nearshore Energy Levels 70

4-G Houston, TX: Nearshore Energy Levels 71

5-G Port Arthur, TX: Nearshore Energy Levels 72

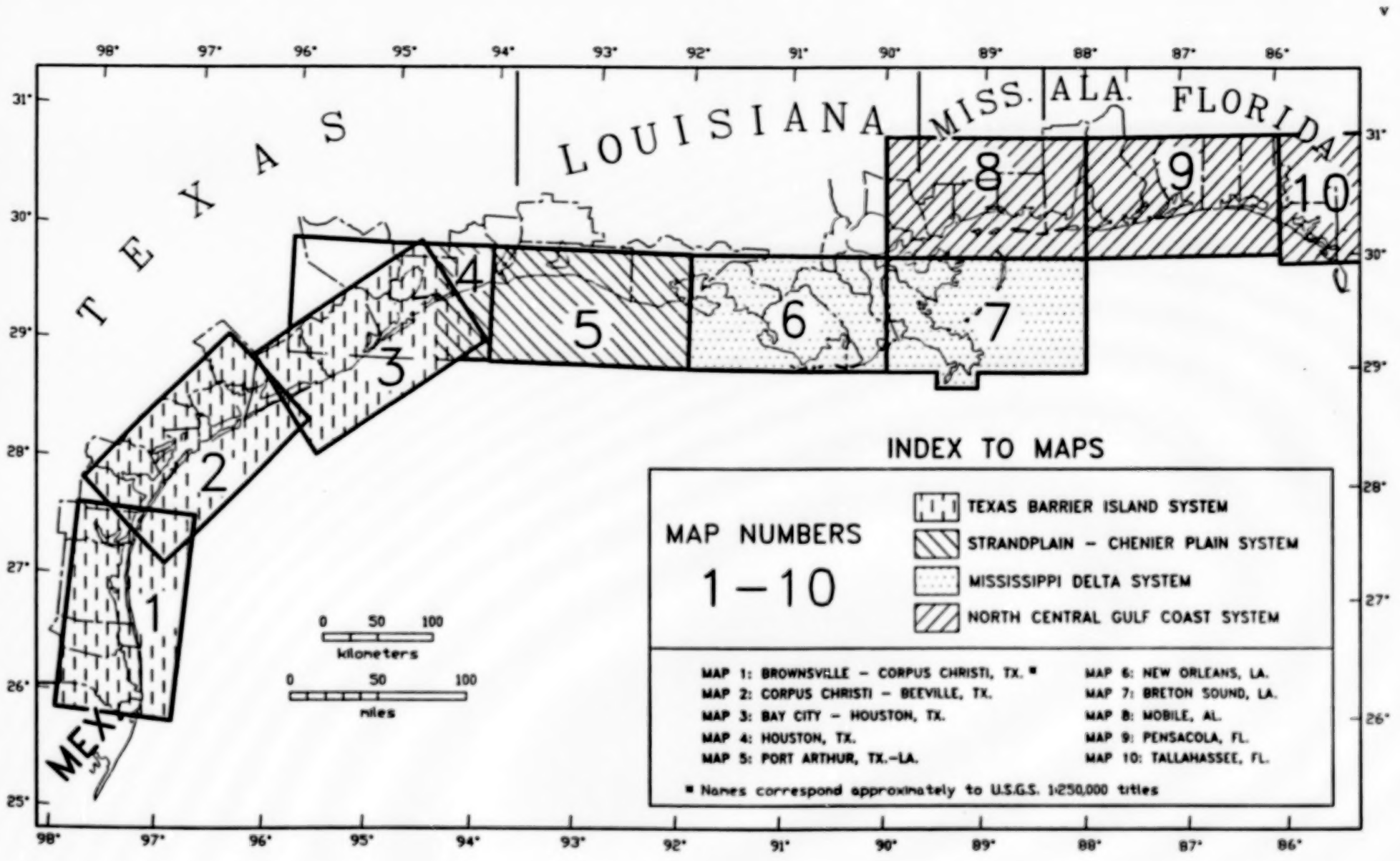
6-G New Orleans, LA: Nearshore Energy Levels 73

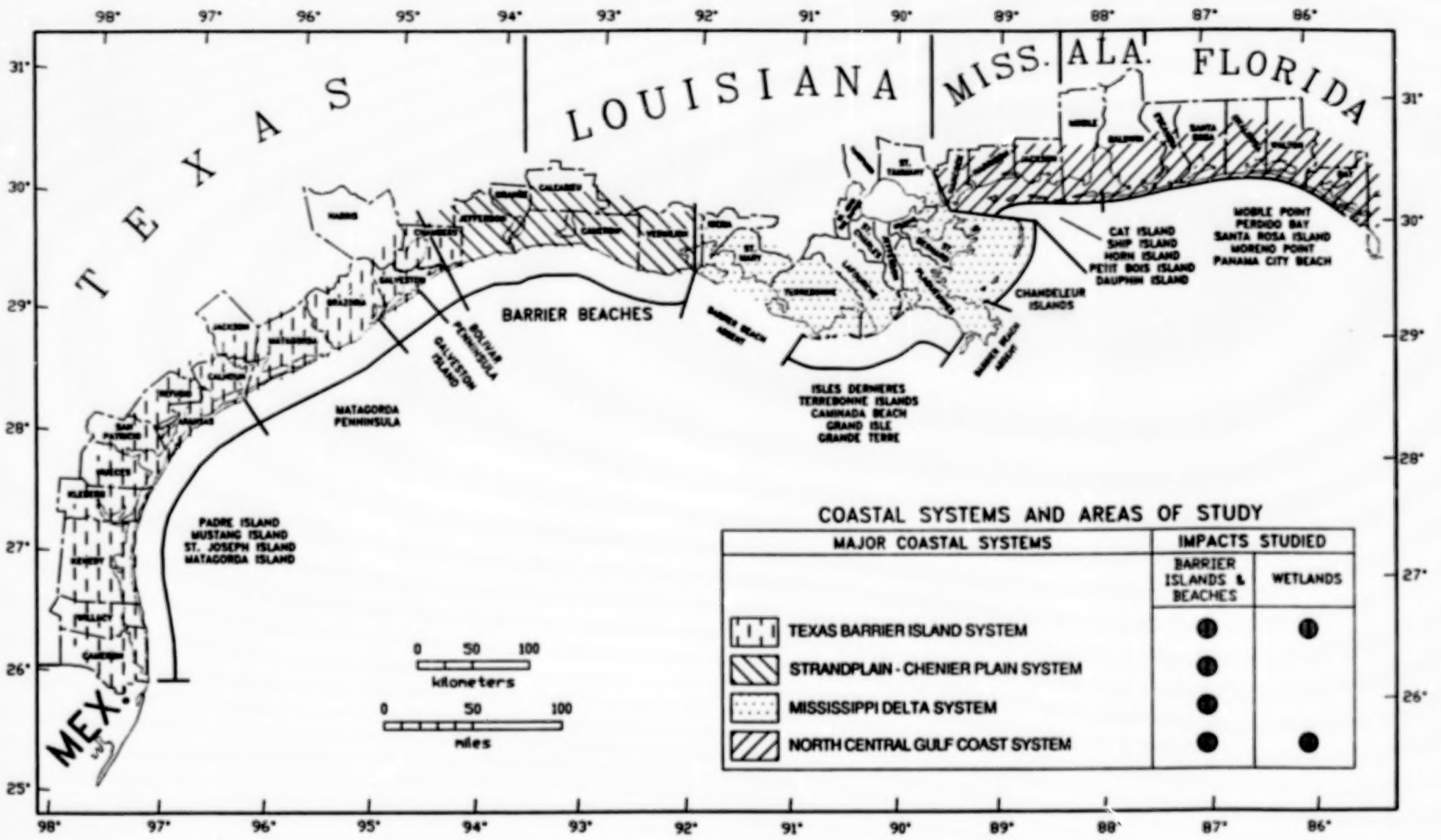
7-G Breton, LA: Nearshore Energy Levels 74

8-G Mobile, AL: Nearshore Energy Levels 75

9-G Pensacola, FL: Nearshore Energy Levels 76

10-G Tallahassee, FL: Nearshore Energy Levels 77


TEXAS
LOUISIANA
MISS.
ALA.
FLORIDA
MEXICO
1
2
3
4
5
6
7
8
9
10
0 50 100
kilometers
0 50 100
miles
INDEX TO MAPS
MAP NUMBERS
1 – 10
TEXAS BARRIER ISLAND SYSTEM
STRANDPLAIN – CHENIER PLAIN SYSTEM
MISSISSIPPI DELTA SYSTEM
NORTH CENTRAL GULF COAST SYSTEM
MAP 1: BROWNSVILLE – CORPUS CHRISTI, TX. *
MAP 2: CORPUS CHRISTI – BEEVILLE, TX.
MAP 3: BAY CITY – HOUSTON, TX.
MAP 4: HOUSTON, TX.
MAP 5: PORT ARTHUR, TX.–LA.
MAP 6: NEW ORLEANS, LA.
MAP 7: BRETON SOUND, LA.
MAP 8: MOBILE, AL.
MAP 9: PENSACOLA, FL.
MAP 10: TALLAHASSEE, FL.
* Names correspond approximately to U.S.G.S. 1:250,000 titles



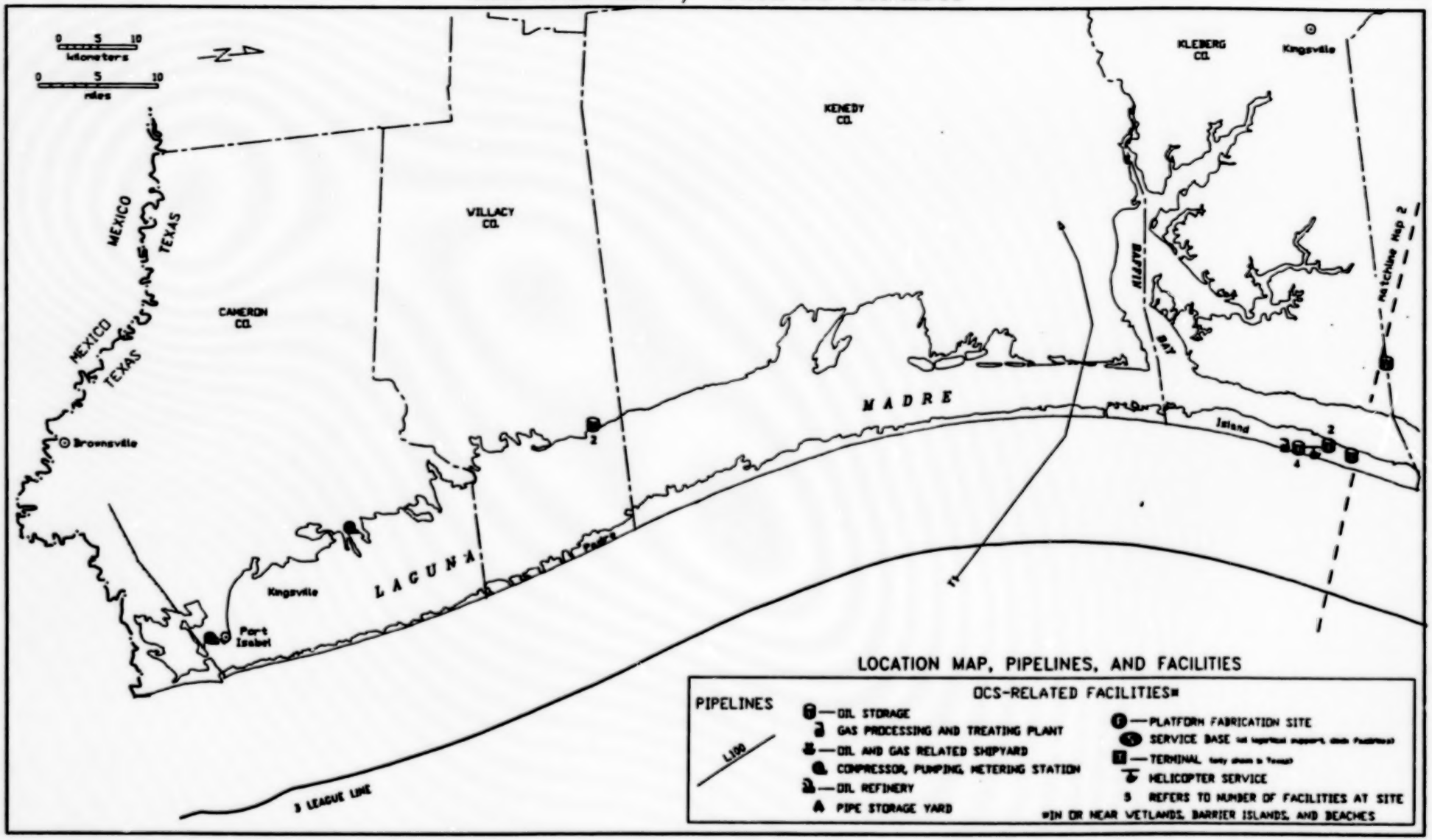
COASTAL SYSTEMS AND AREAS OF STUDY

MAJOR COASTAL SYSTEMS	IMPACTS STUDIED	
	BARRIER ISLANDS & BEACHES	WETLANDS
TEXAS BARRIER ISLAND SYSTEM	●	●
STRANDPLAIN - CHENIER PLAIN SYSTEM	●	
MISSISSIPPI DELTA SYSTEM	●	
NORTH CENTRAL GULF COAST SYSTEM	●	●

Maps 1A - 10A

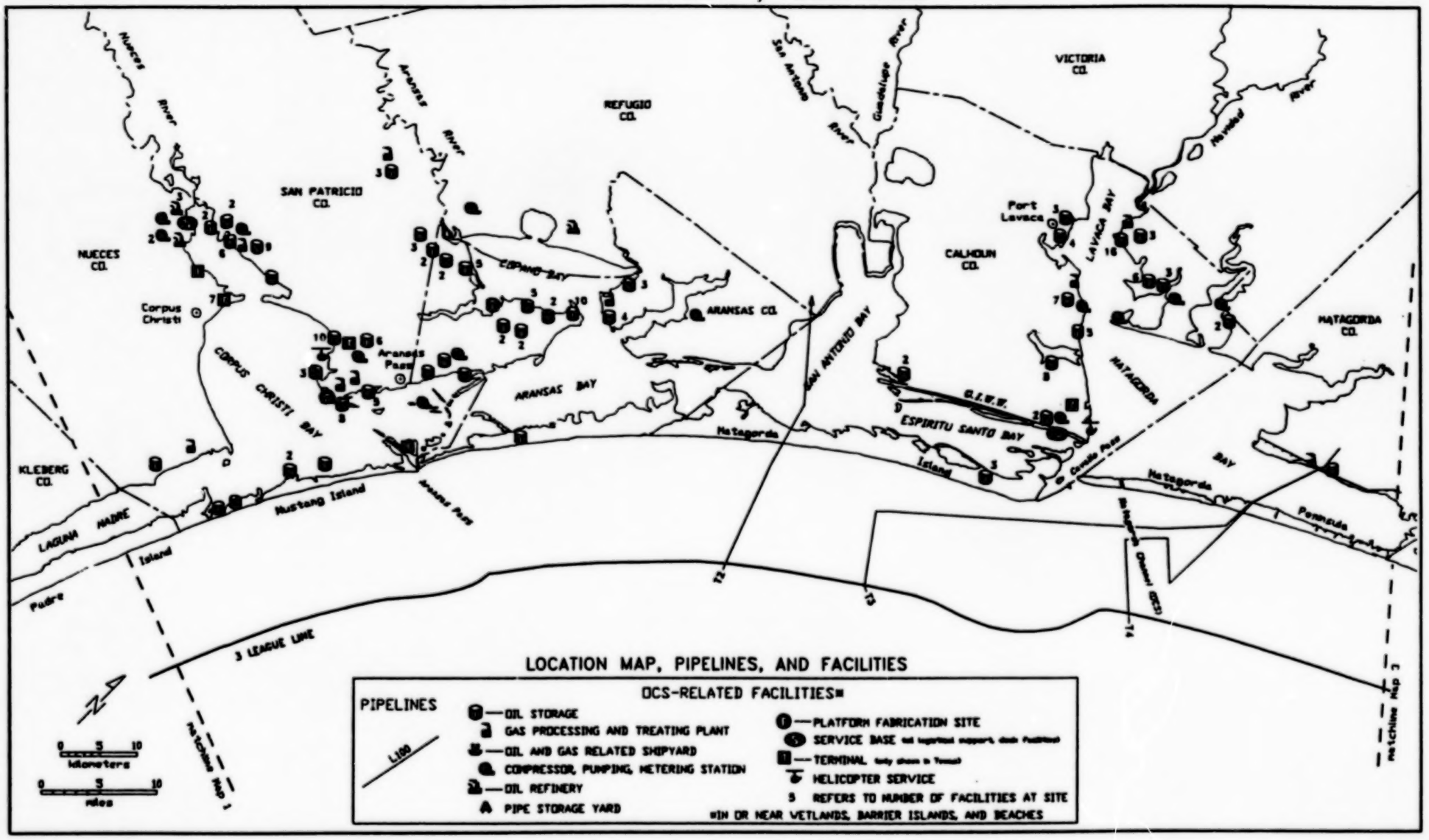
LOCATION MAP, PIPELINES, AND OCS-RELATED FACILITIES

BROWNSVILLE / CORPUS CHRISTI



Map 1 - A

CORPUS CHRISTI / BEEVILLE



LOCATION MAP, PIPELINES, AND FACILITIES

PIPELINES

L100

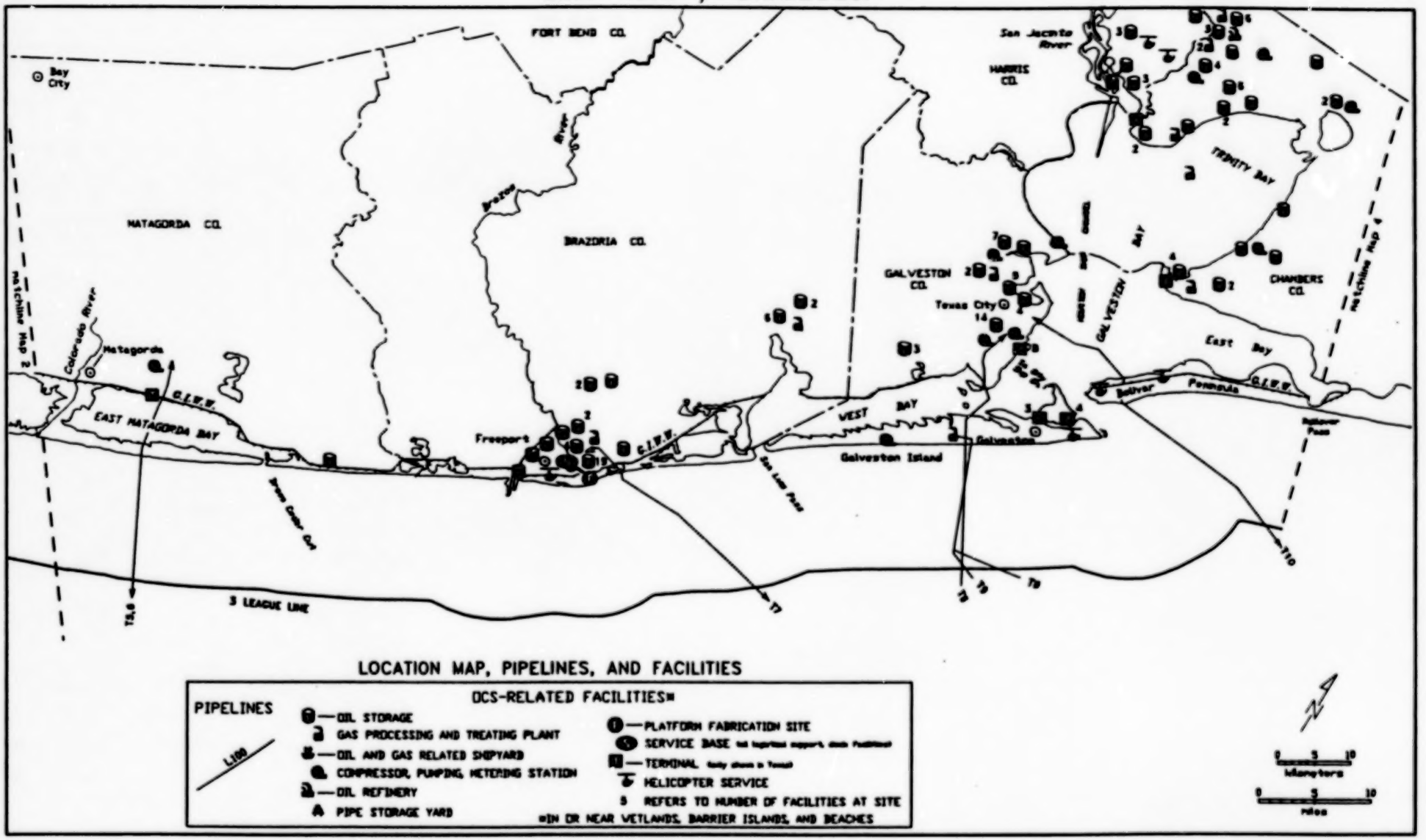
OCS-RELATED FACILITIES*

- OIL STORAGE
- GAS PROCESSING AND TREATING PLANT
- OIL AND GAS RELATED SHIPYARD
- COMPRESSOR, PUMPING, METERING STATION
- OIL REFINERY
- PIPE STORAGE YARD
- PLATFORM FABRICATION SITE
- SERVICE BASE not logistical support, deck facilities
- TERMINAL (only shown in Texas)
- HELICOPTER SERVICE
- 5 REFERS TO NUMBER OF FACILITIES AT SITE

*IN OR NEAR WETLANDS, BARRIER ISLANDS, AND BEACHES

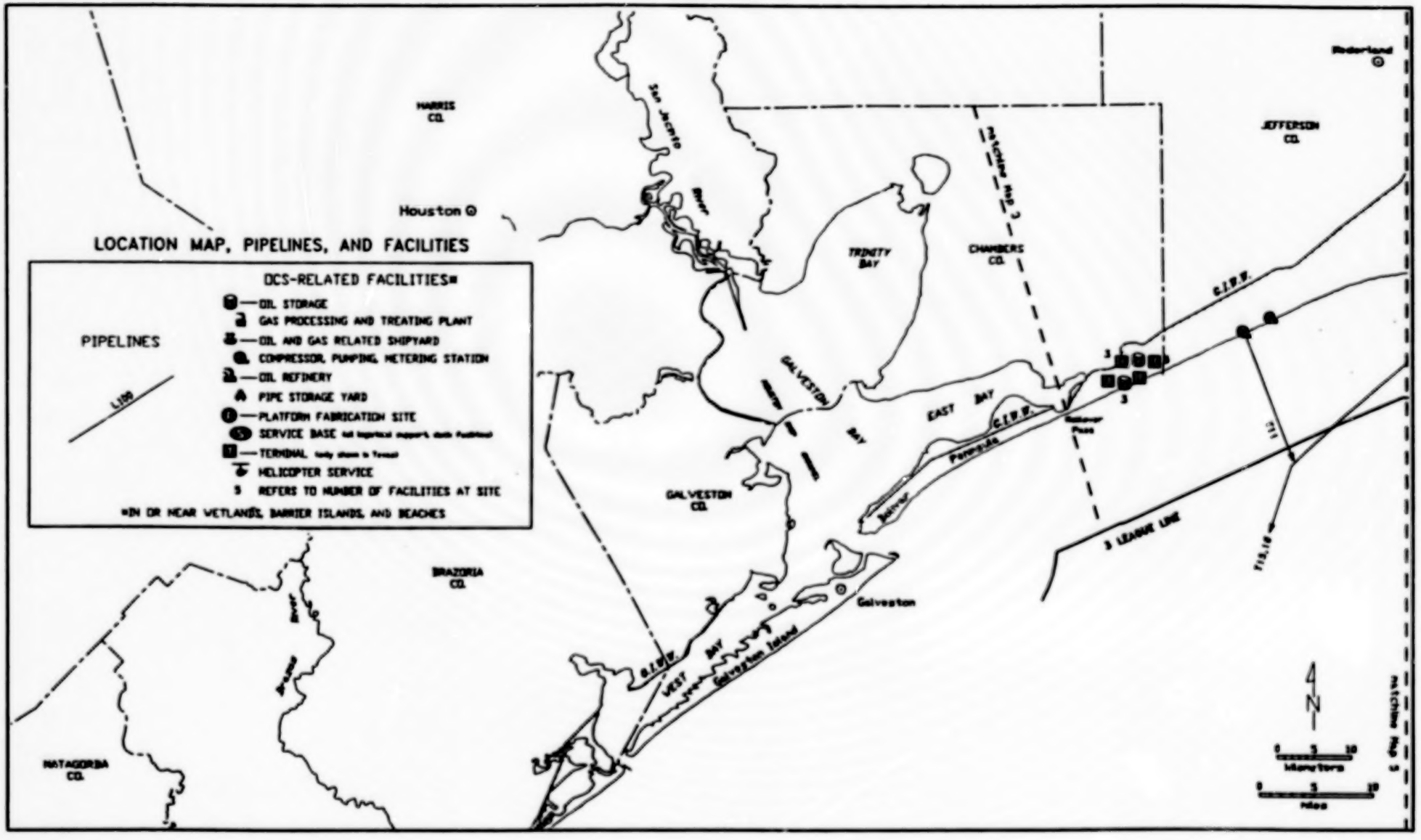
Map 2 - A

BAY CITY / HOUSTON



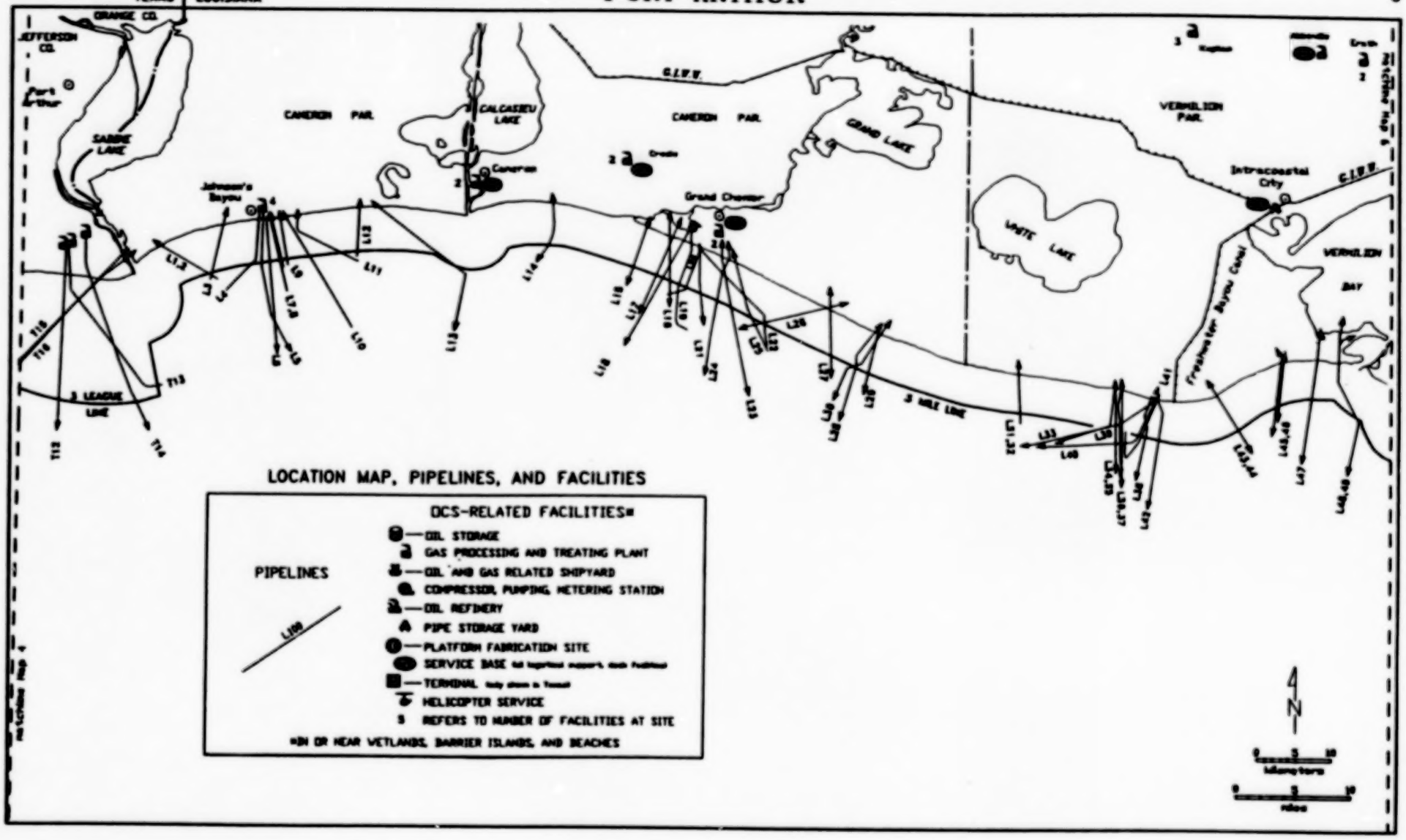
Map 3 - A

HOUSTON



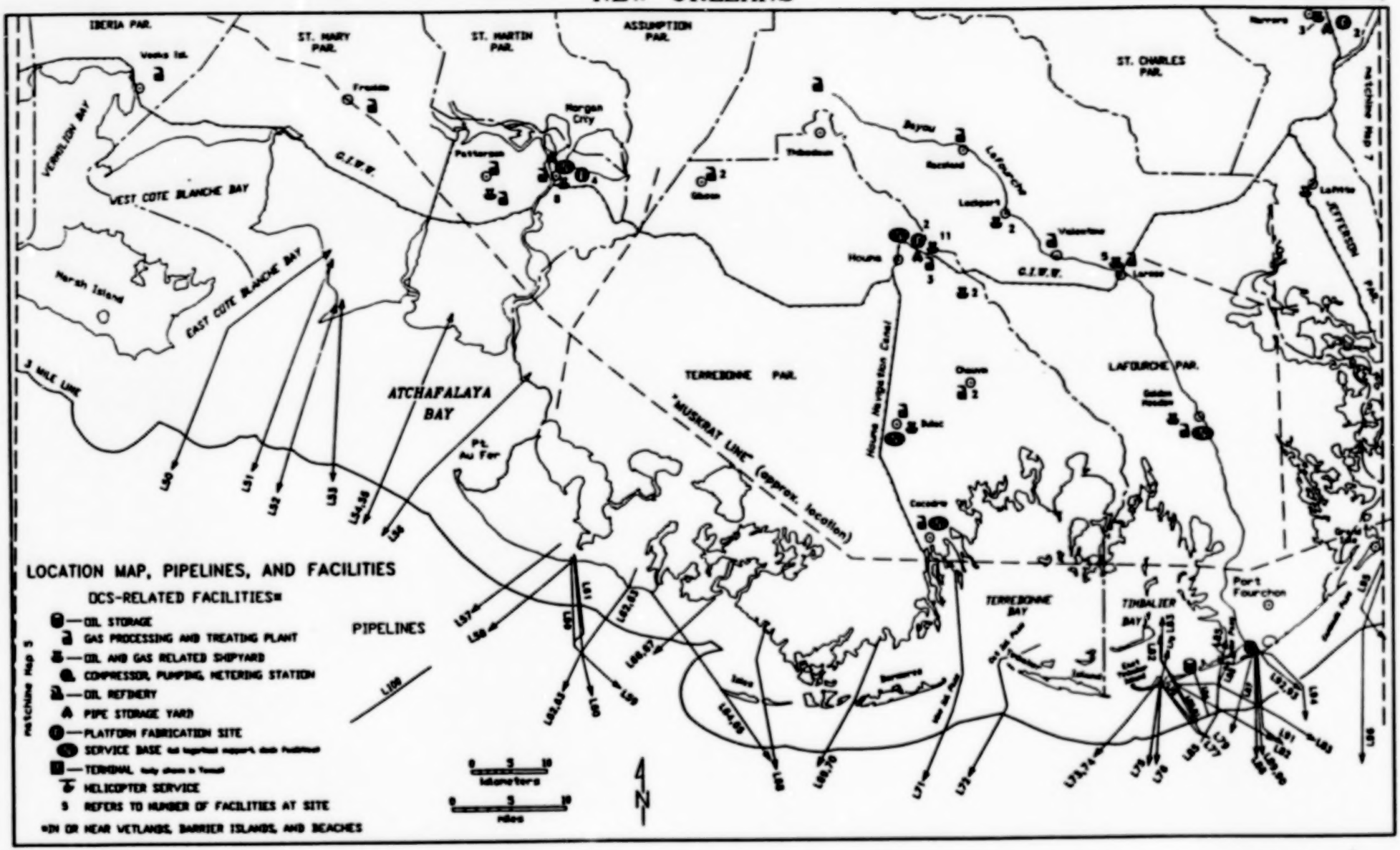
Map 4 - A

PORT ARTHUR



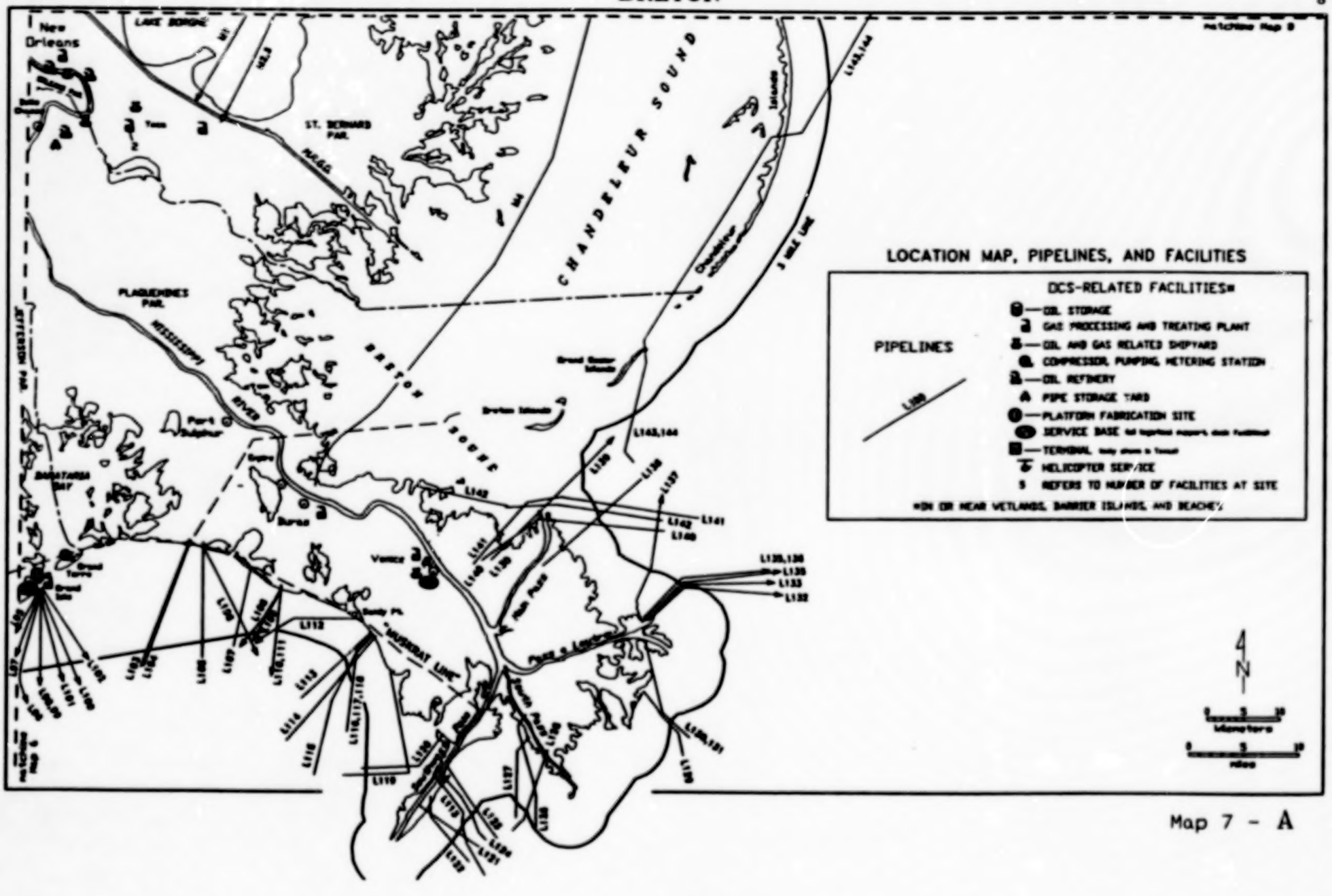
Map 5 - A

NEW ORLEANS

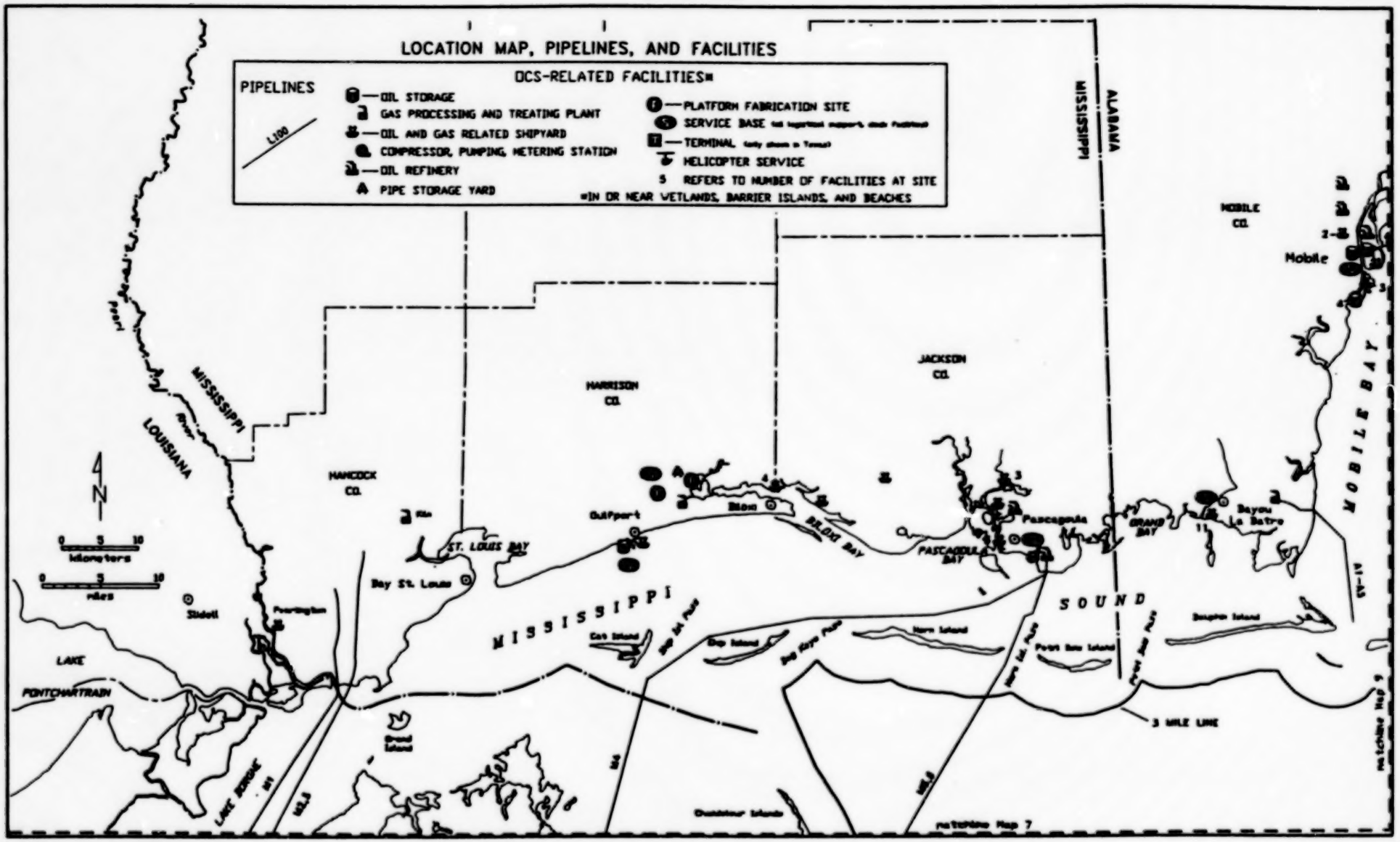


Map 6 - A

BRETON

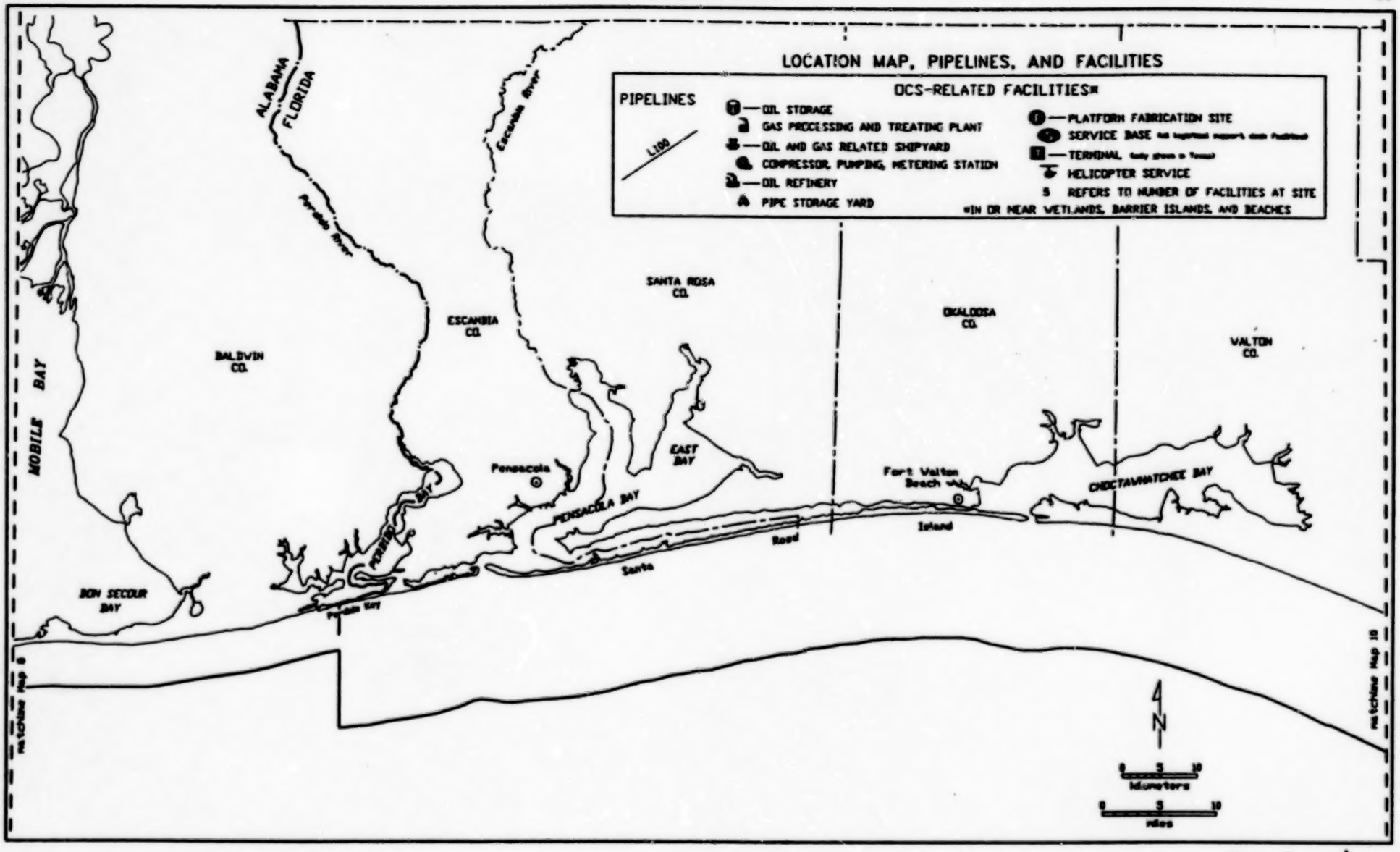


Map 7 - A


LOCATION MAP, PIPELINES, AND FACILITIES
PIPELINES
L100
OCS-RELATED FACILITIES[1]
OIL STORAGE
GAS PROCESSING AND TREATING PLANT
OIL AND GAS RELATED SHIPYARD
COMPRESSOR, PUMPING, METERING STATION
OIL REFINERY
PIPE STORAGE YARD
PLATFORM FABRICATION SITE
SERVICE BASE
TERMINAL
HELICOPTER SERVICE
5 REFERS TO NUMBER OF FACILITIES AT SITE
[1]IN OR NEAR WETLANDS, BARRIER ISLANDS, AND BEACHES
MISSISSIPPI
ALABAMA
MOBILE CO.
Mobile
JACKSON CO.
HARRISON CO.
HANCOCK CO.
LOUISIANA
MISSISSIPPI River
MOBILE BAY
Biloxi
Gulfport
ST. LOUIS BAY
Bay St. Louis
Pascagoula
PASCAGOULA BAY
GRAND BAY
Bayou La Batre
MISSISSIPPI SOUND
Horn Island
Petit Bois Island
Dauphin Island
Ship Island
Cat Island
Chandeleur Islands
LAKE PONTCHARTRAIN
LAKE BORGNE
3 MILE LINE
matchline Map 9
matchline Map 7
0 5 10 kilometers
0 5 10 miles

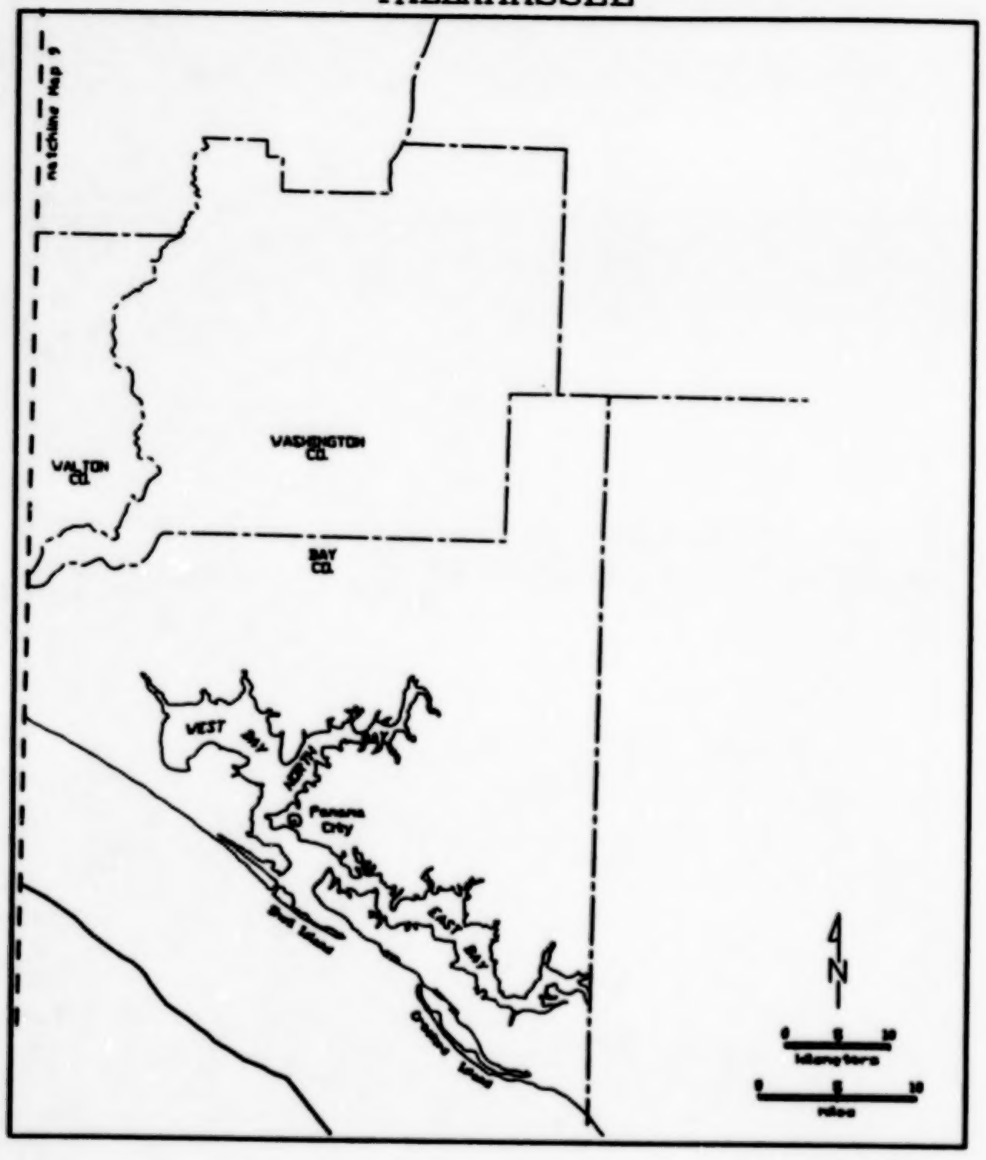
Map 8 - A

PENSACOLA



Map 9 - A

TALLAHASSEE



Map 10 - A

LOCATION MAP, PIPELINES, AND FACILITIES

PIPELINES

Line

OCS-RELATED FACILITIES*

- OIL STORAGE
- GAS PROCESSING AND TREATING PLANT
- OIL AND GAS RELATED SHIPYARD
- COMPRESSOR, PUMPING, METERING STATION
- OIL REFINERY
- PIPE STORAGE YARD
- PLATFORM FABRICATION SITE
- SERVICE BASE
- TERMINAL
- HELICOPTER SERVICE
- 5 REFERS TO NUMBER OF FACILITIES AT SITE

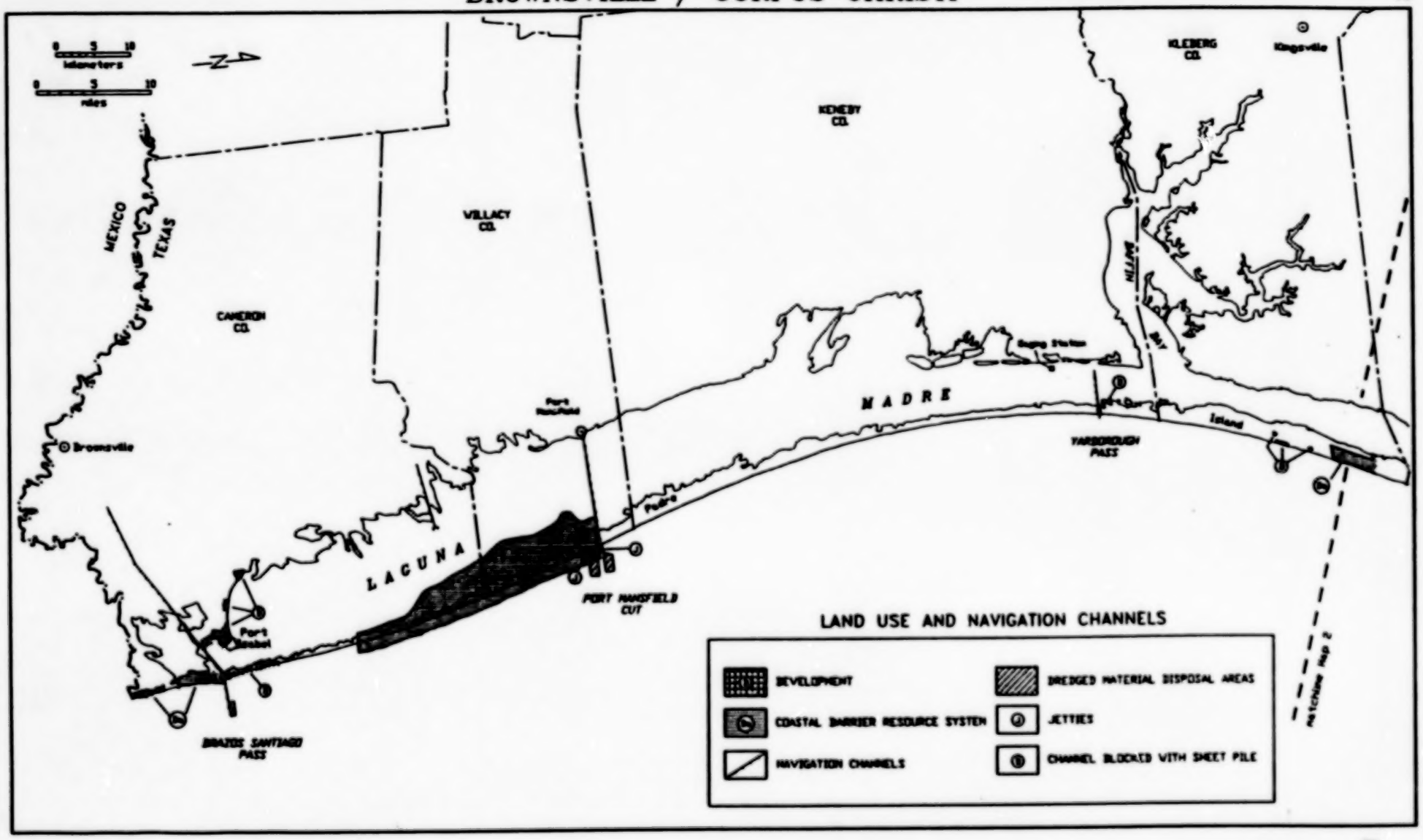
*IN OR NEAR WETLANDS, BARRIER ISLANDS, AND BEACHES

12

Maps 1B - 10B

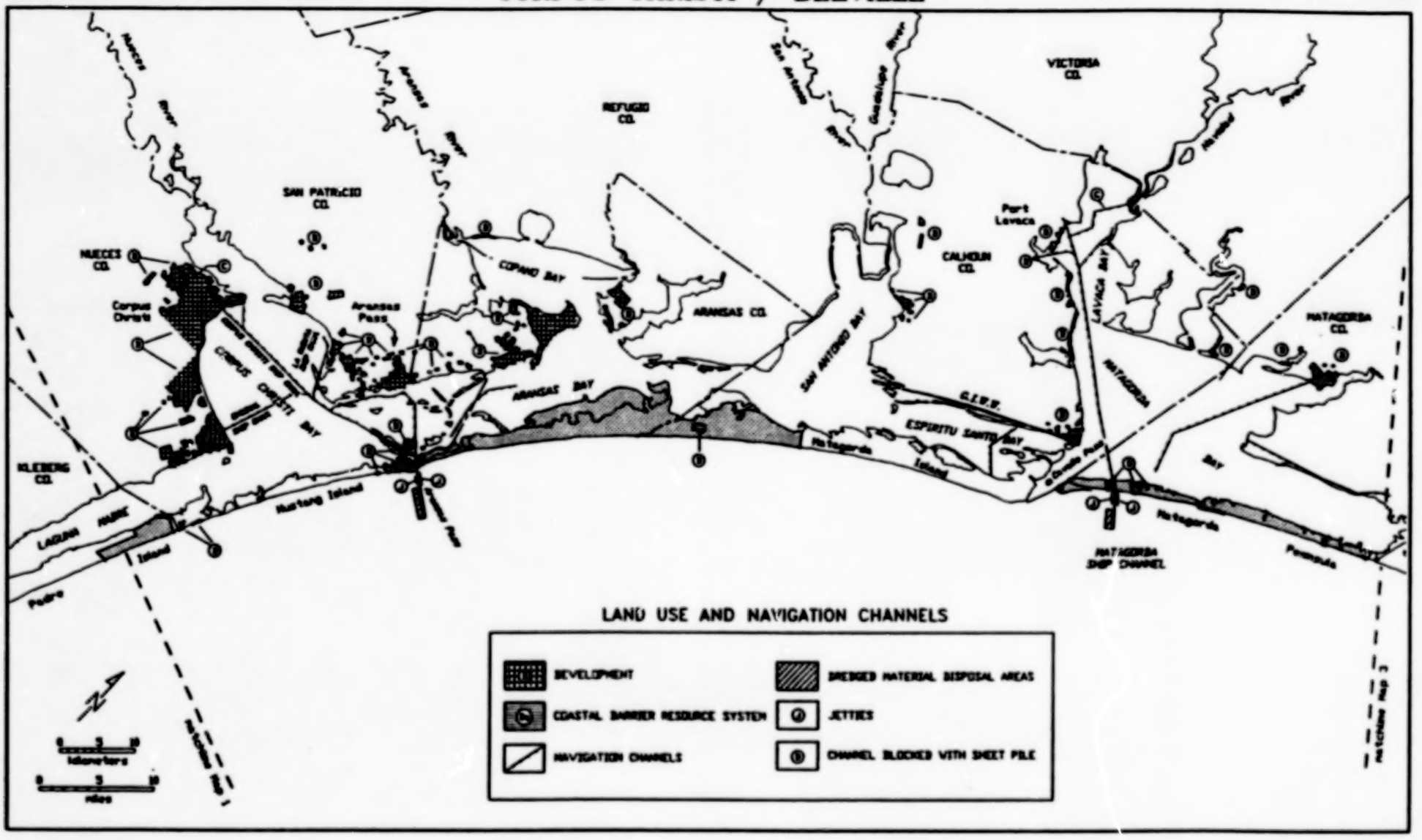
LAND USE AND NAVIGATION CHANNELS

BROWNSVILLE / CORPUS CHRISTI



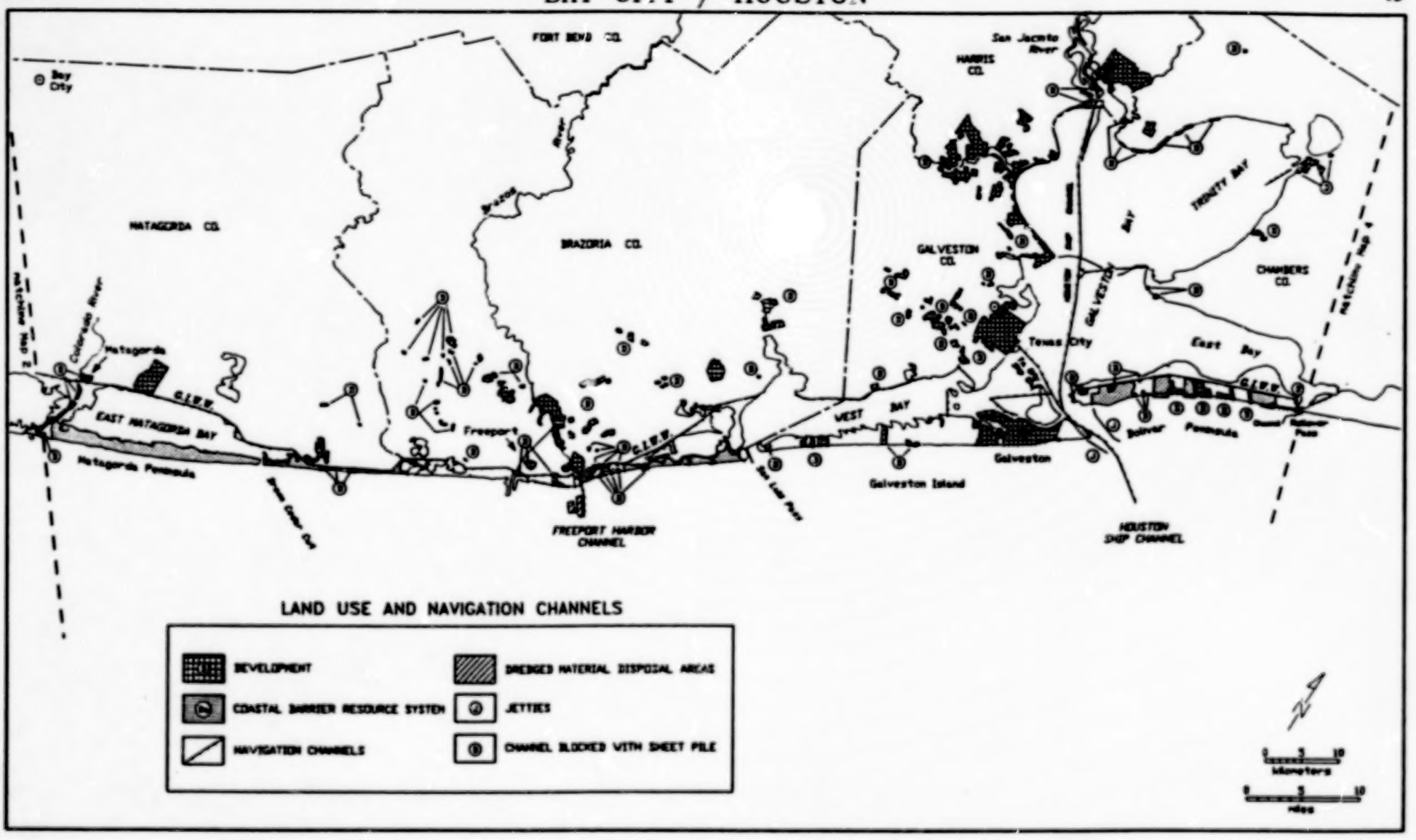
Map 1 - B

CORPUS CHRISTI / BEEVILLE



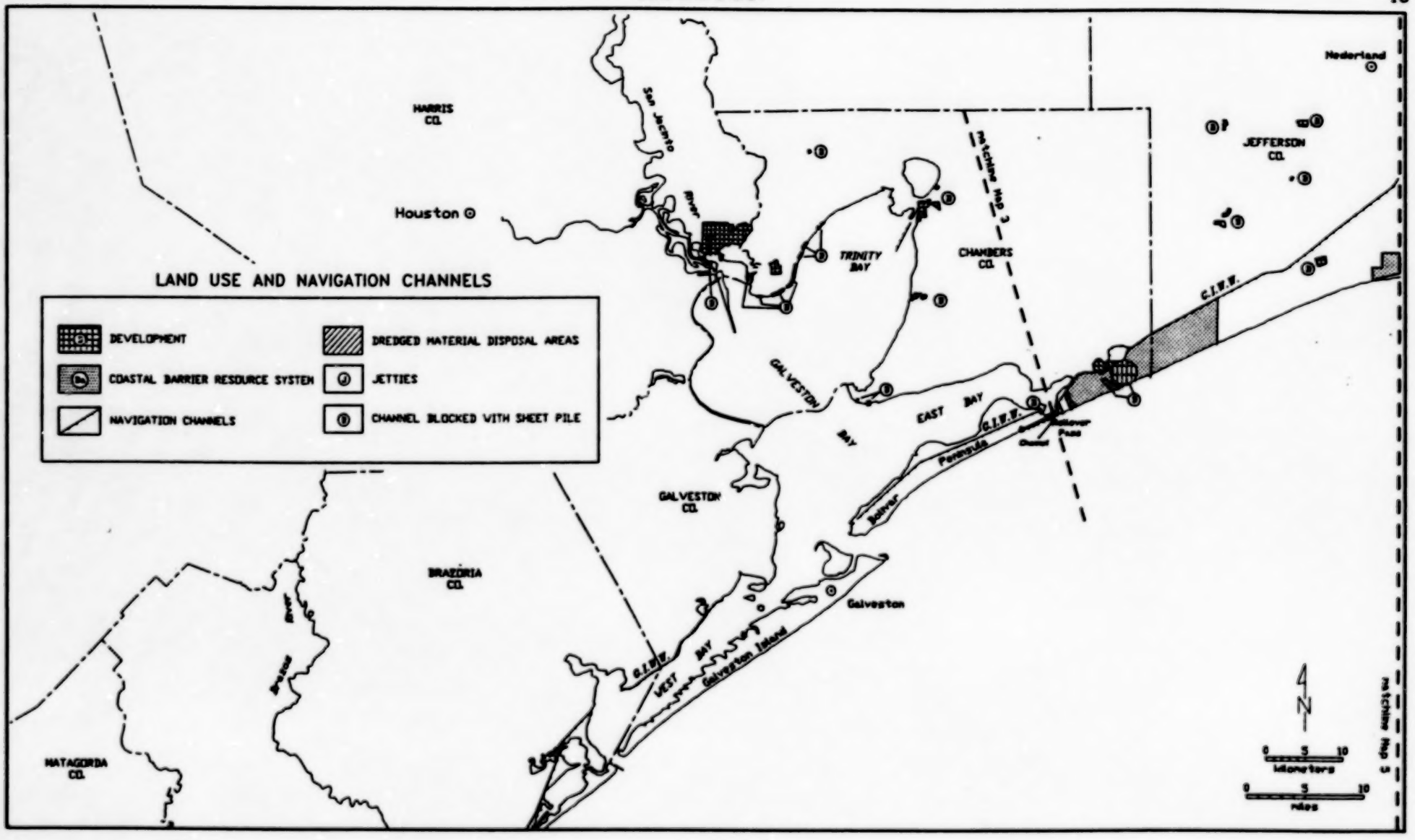
Map 2 - B

BAY CITY / HOUSTON



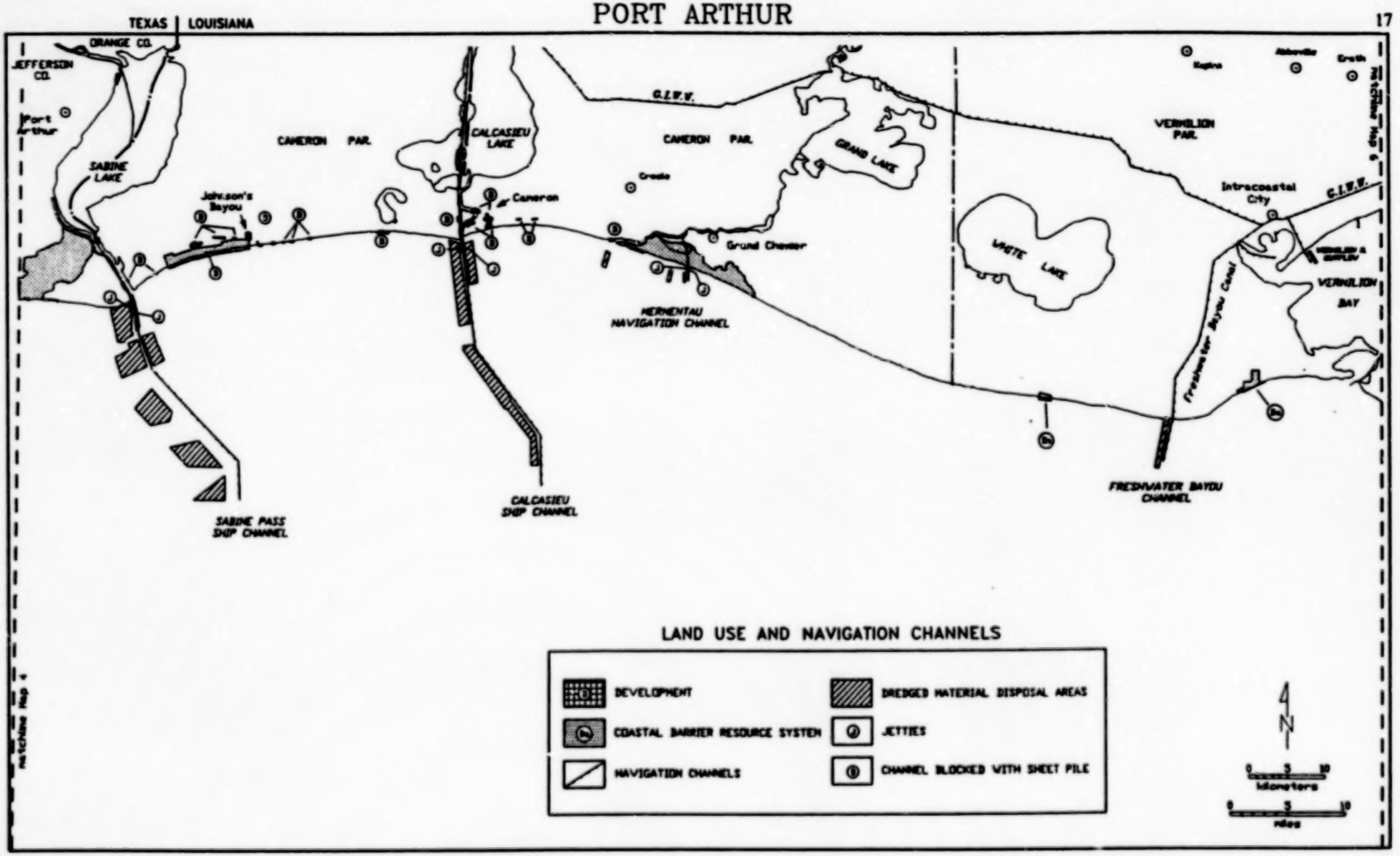
Map 3 - B

HOUSTON



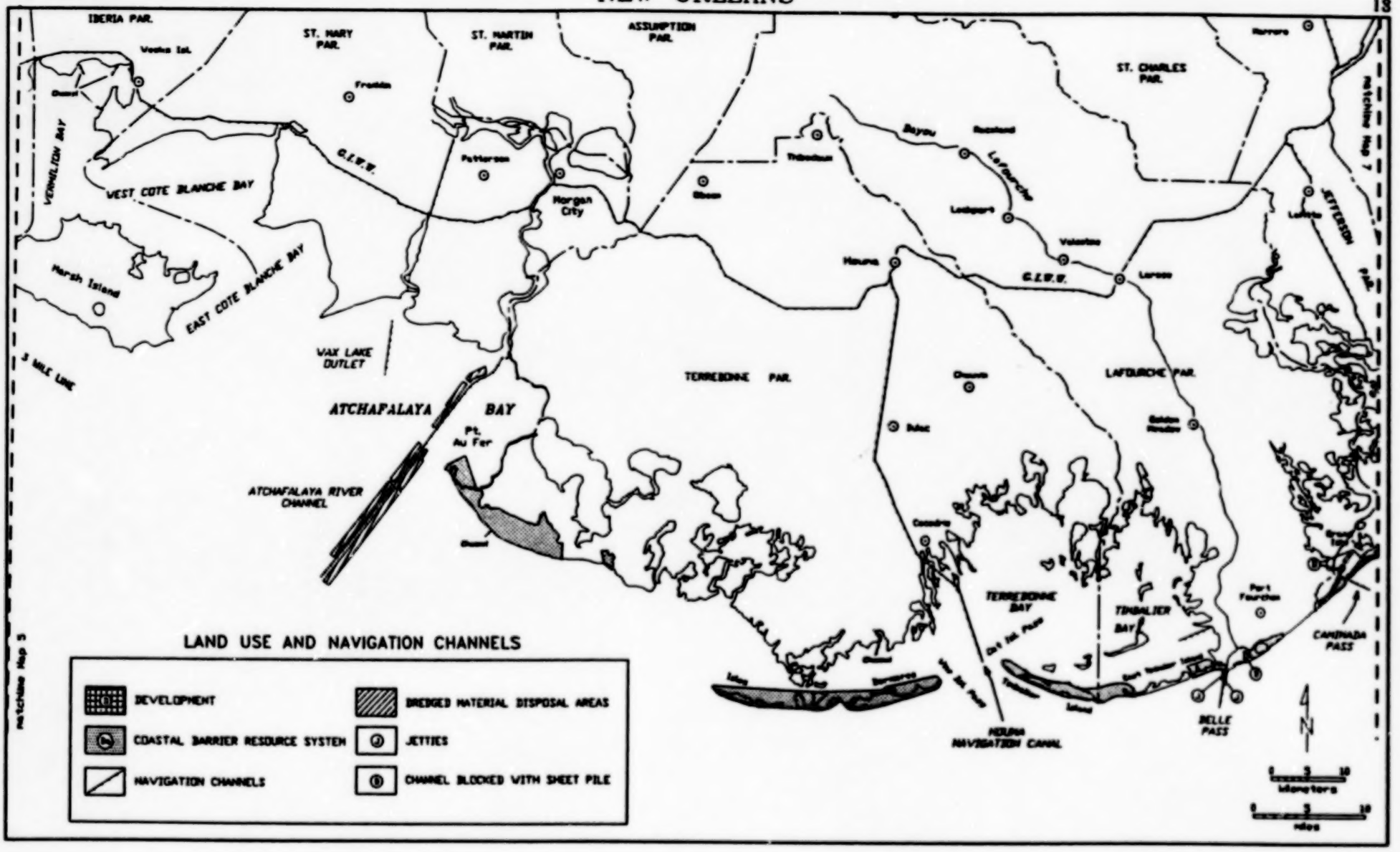
Map 4 - B

PORT ARTHUR

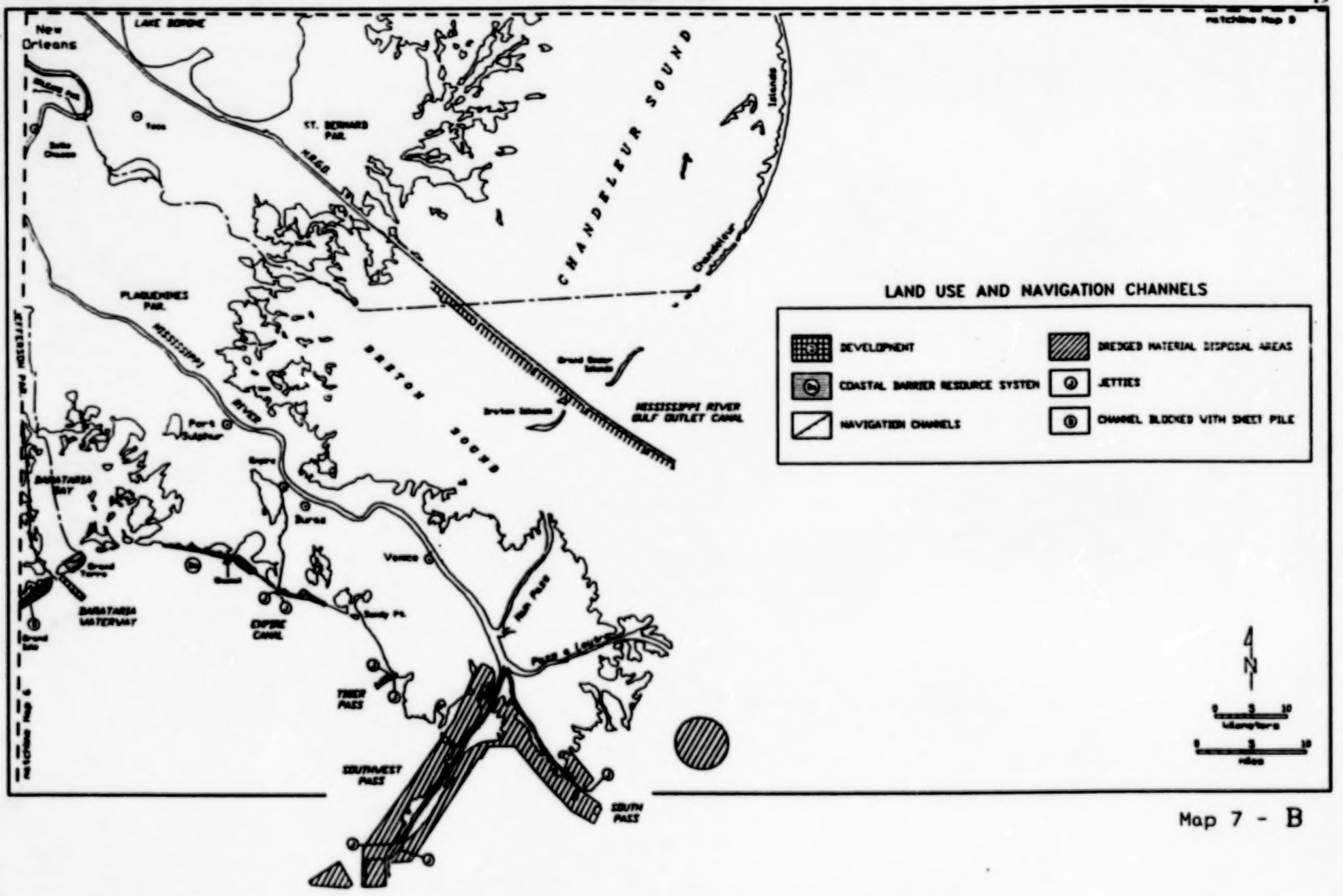


Map 5 - B

NEW ORLEANS

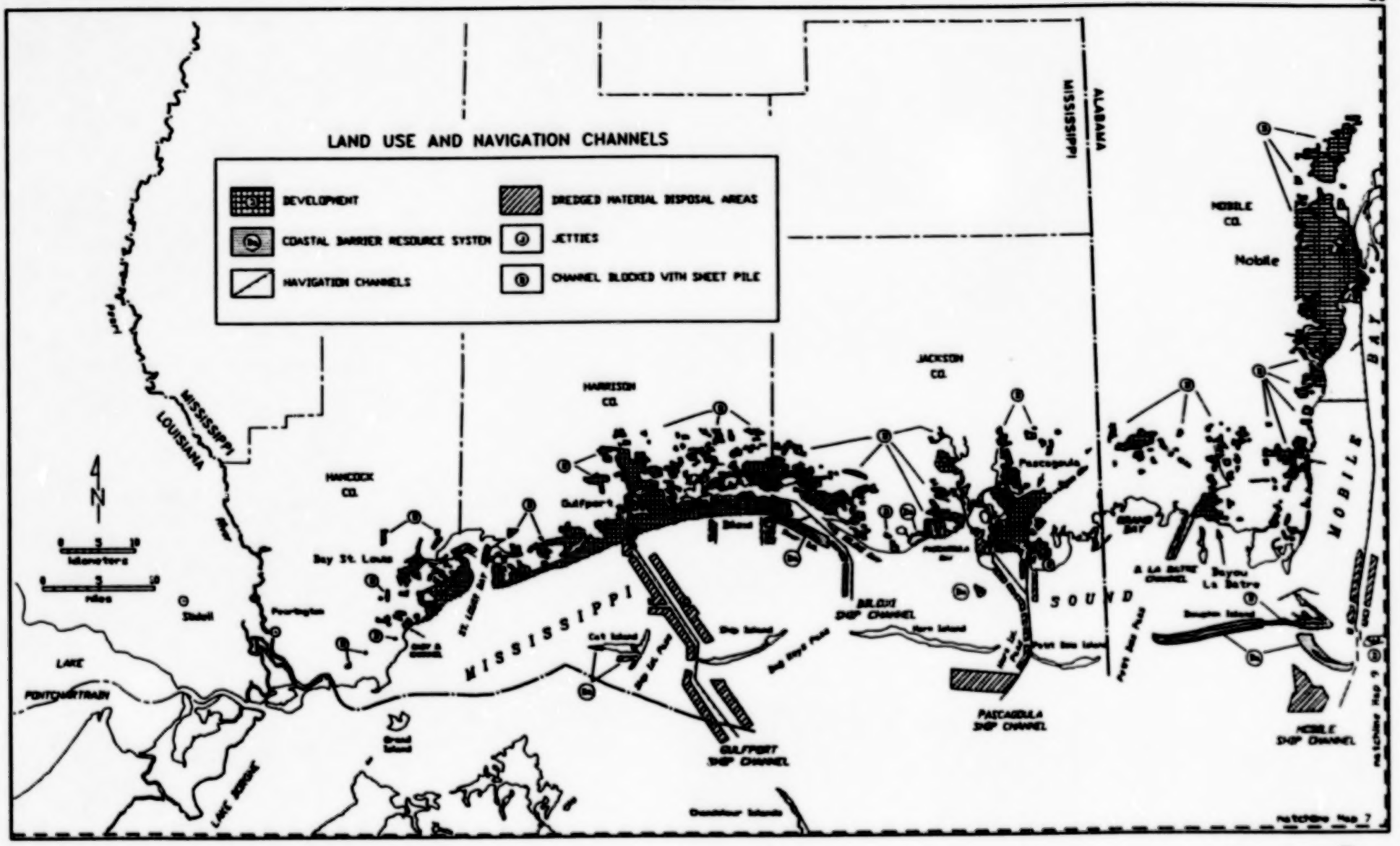


Map 6 - B


New Orleans
LAKE BORGNE
ST. BERNARD PAR.
MRGO
CHANDELEUR SOUND
PLAQUEMINES PAR.
MISSISSIPPI RIVER
BRETON SOUND
MISSISSIPPI RIVER GULF OUTLET CANAL
BARATARIA BAY
BARATARIA WATERWAY
EMPIRE CANAL
TIGER PASS
SOUTHWEST PASS
SOUTH PASS
LAND USE AND NAVIGATION CHANNELS
DEVELOPMENT
COASTAL BARRIER RESOURCE SYSTEM
NAVIGATION CHANNELS
DREDGED MATERIAL DISPOSAL AREAS
JETTIES
CHANNEL BLOCKED WITH SHEET PILE
N
kilometers
miles

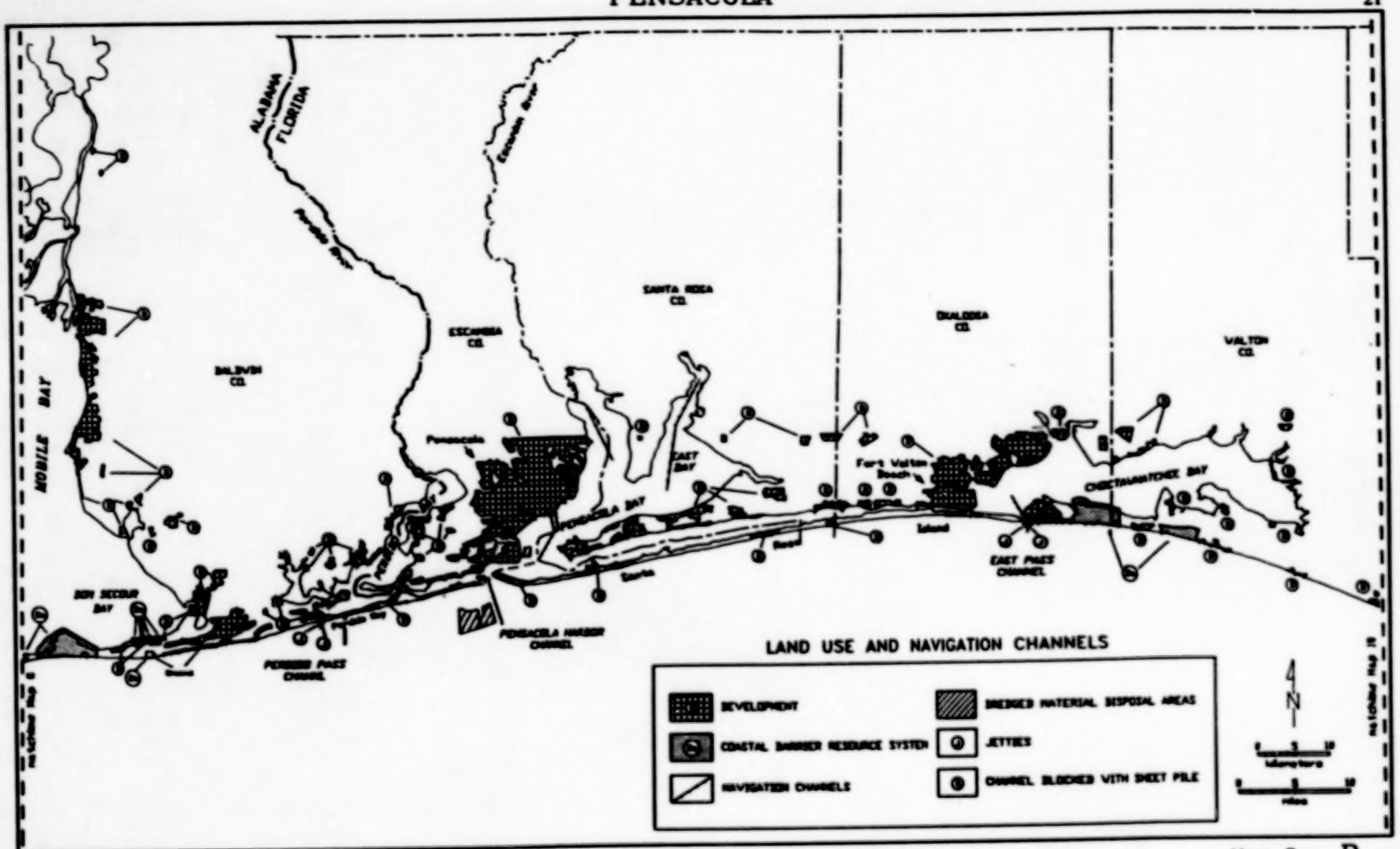
Map 7 - B

MOBILE



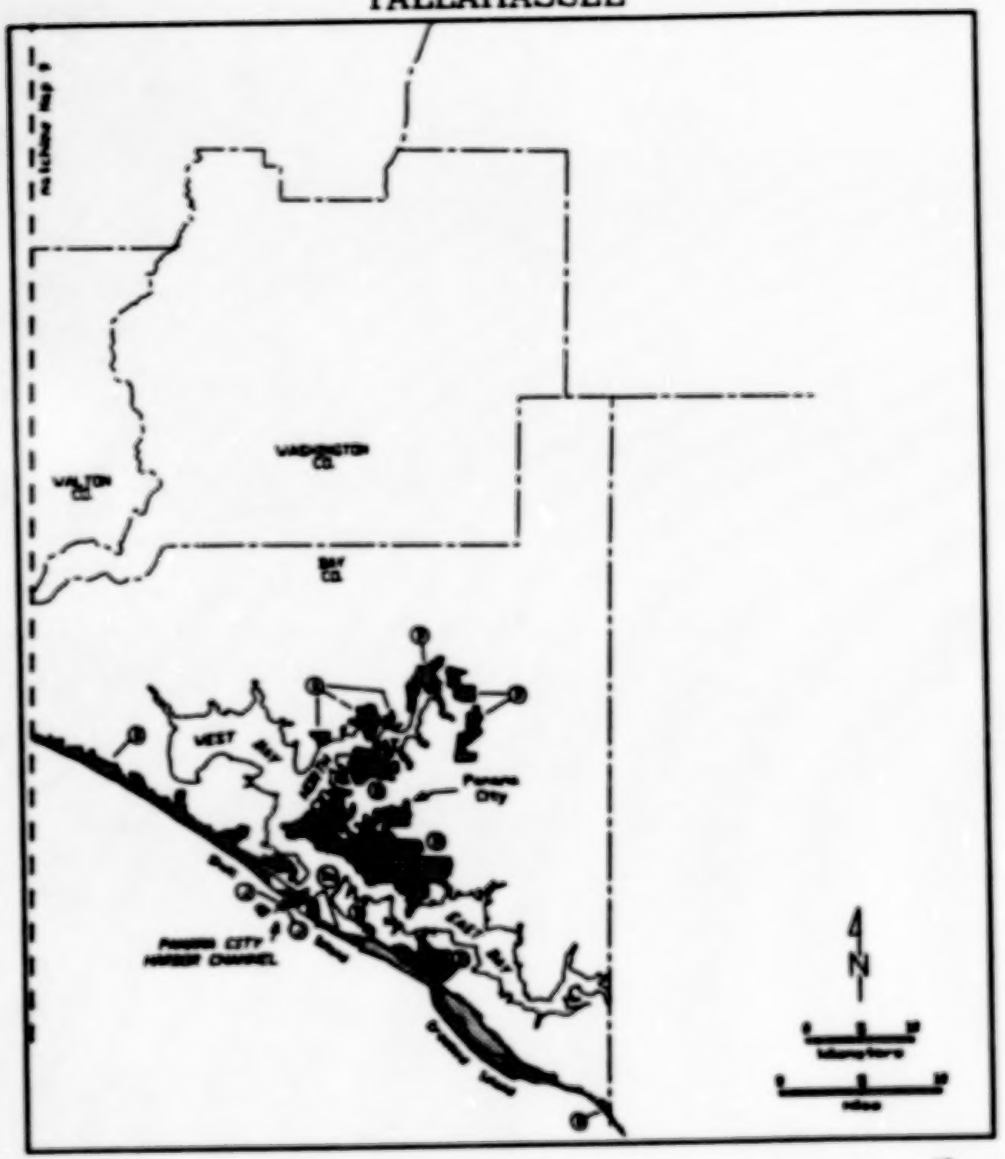
Map 8 - B

PENSACOLA



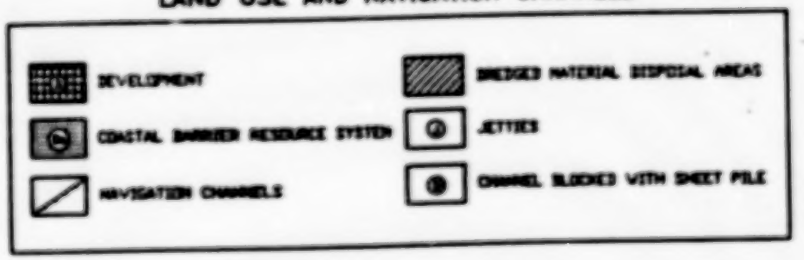
Map 9 - B

TALLAHASSEE



Map 10 - B

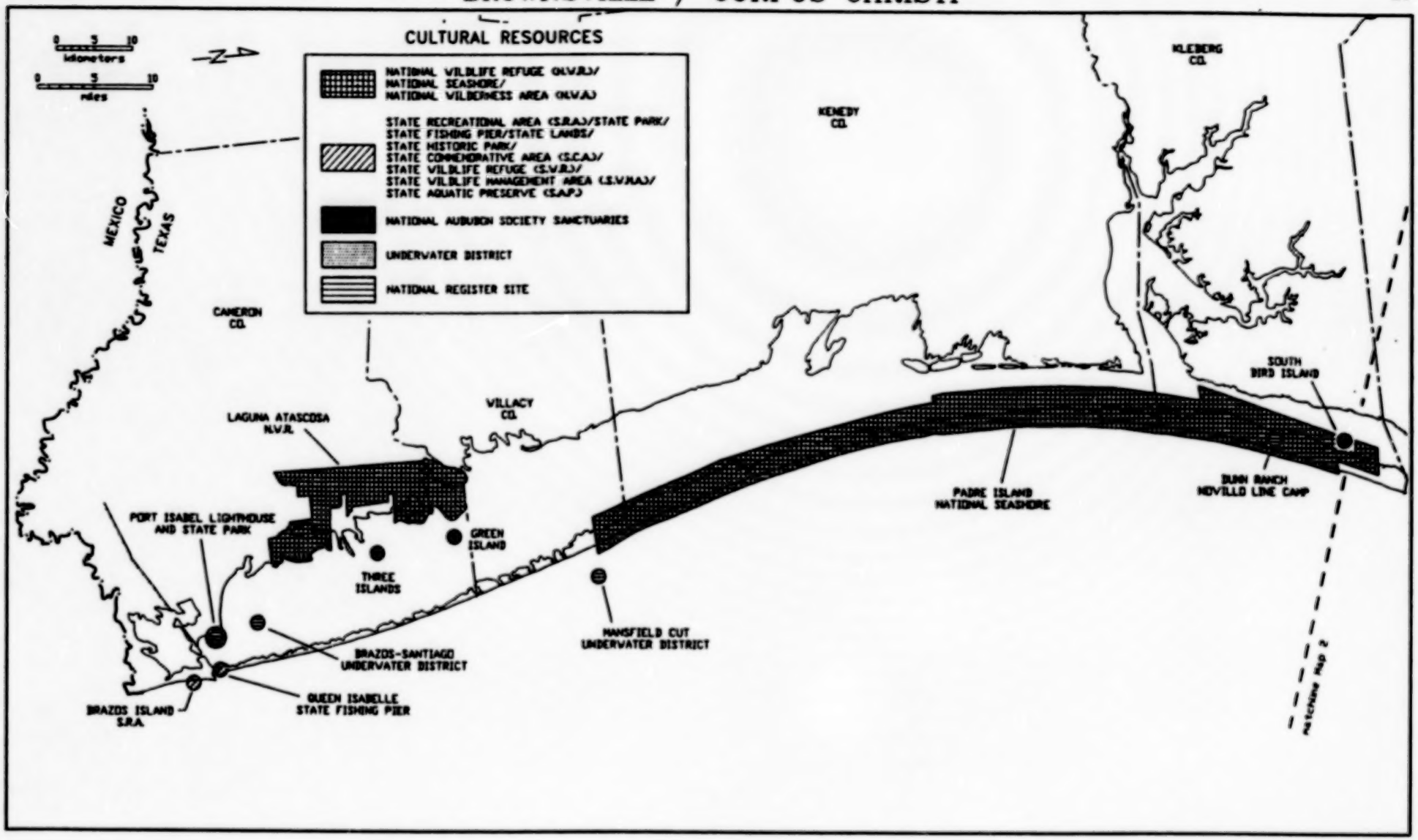
LAND USE AND NAVIGATION CHANNELS



Maps 1C - 10C

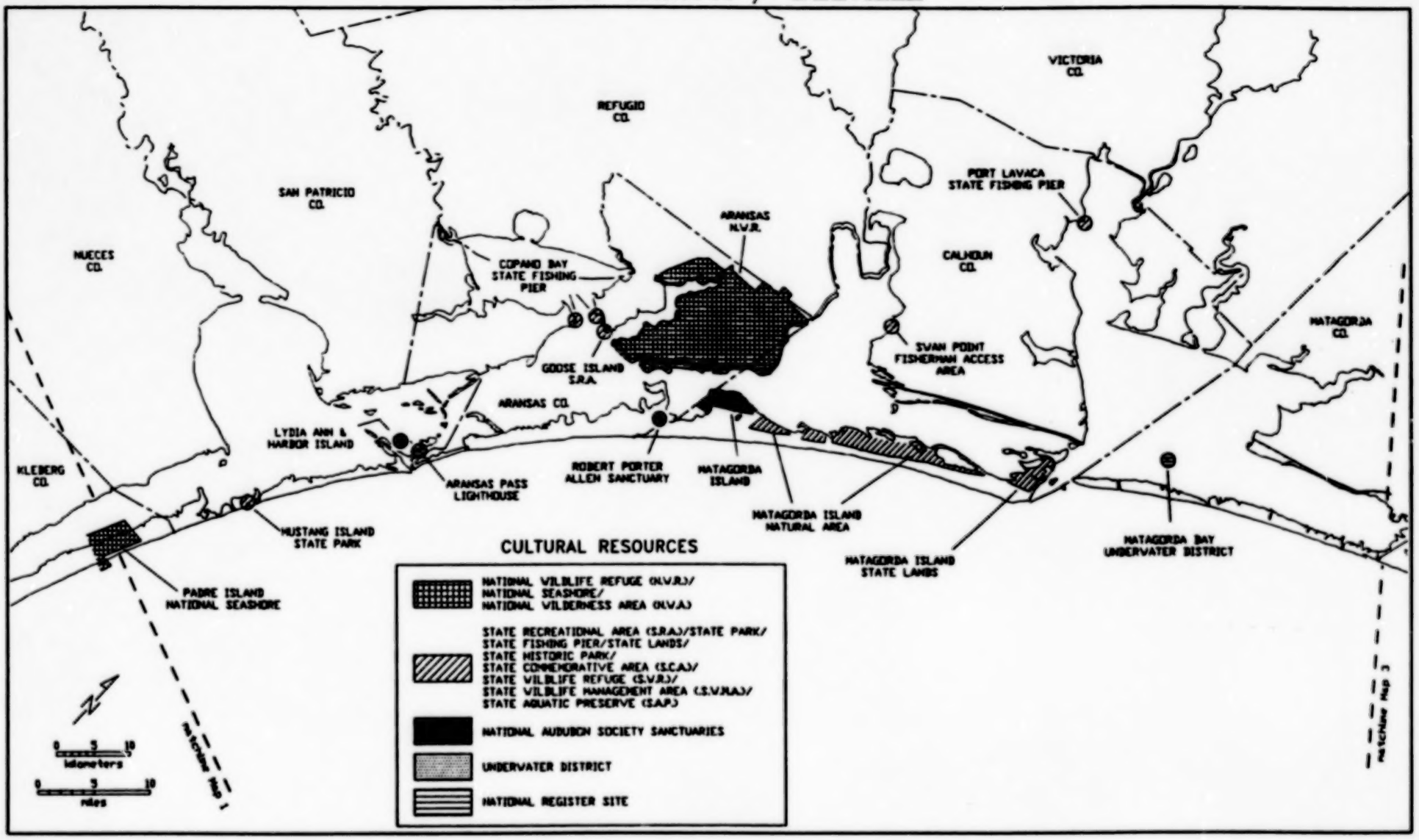
CULTURAL RESOURCES

BROWNSVILLE / CORPUS CHRISTI



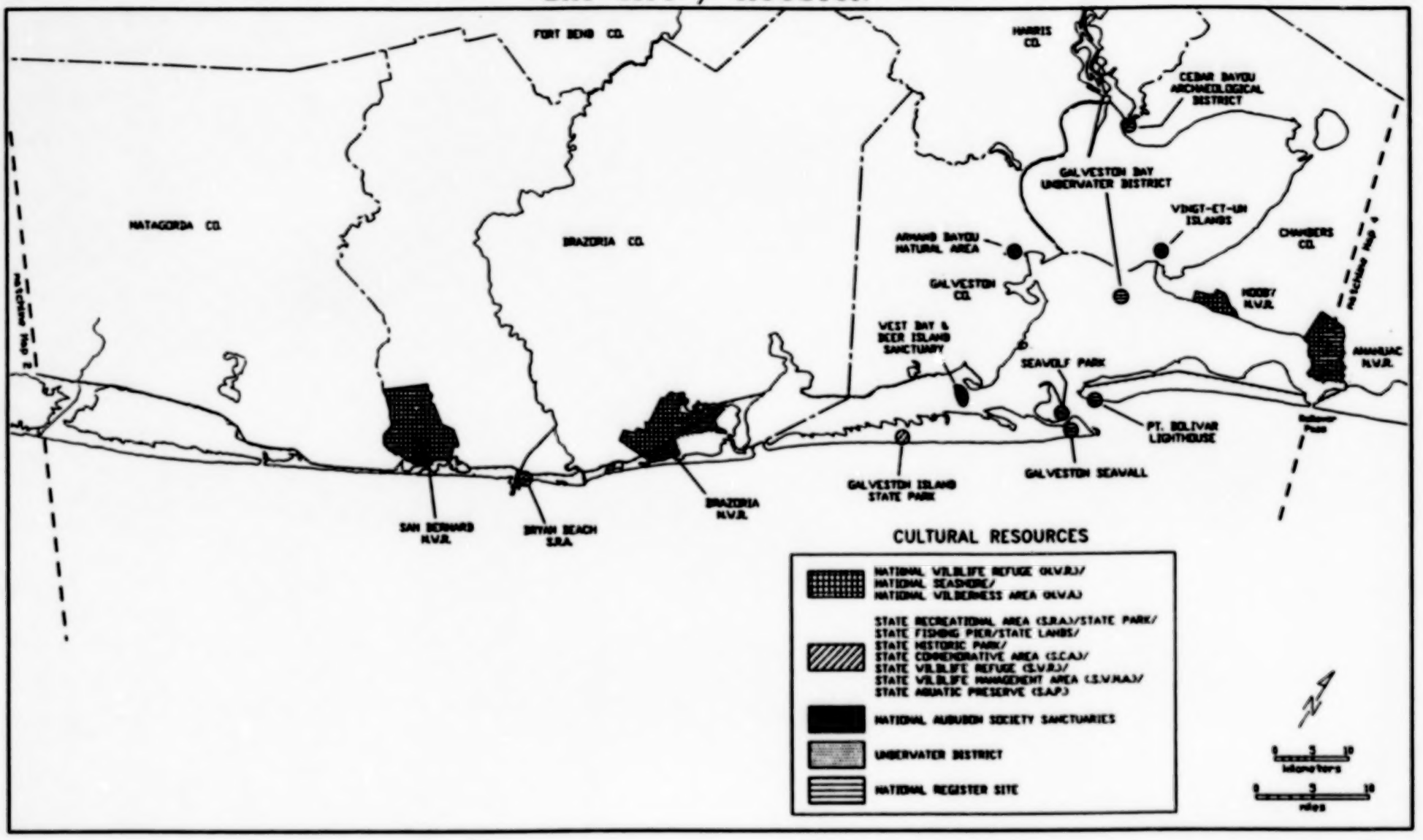
Map 1 - C

CORPUS CHRISTI / BEEVILLE


VICTORIA CO.
REFUGIO CO.
SAN PATRICIO CO.
NUECES CO.
ARANSAS N.W.R.
COPANO BAY STATE FISHING PIER
PORT LAVACA STATE FISHING PIER
CALHOUN CO.
MATAGORDA CO.
SWAN POINT FISHERMAN ACCESS AREA
GOOSE ISLAND S.R.A.
ARANSAS CO.
LYDIA ANN & HARBOR ISLAND
KLEBERG CO.
ARANSAS PASS LIGHTHOUSE
ROBERT PORTER ALLEN SANCTUARY
MATAGORDA ISLAND
MATAGORDA ISLAND NATURAL AREA
MUSTANG ISLAND STATE PARK
MATAGORDA ISLAND STATE LANDS
MATAGORDA BAY UNDERWATER DISTRICT
PADRE ISLAND NATIONAL SEASHORE
CULTURAL RESOURCES
NATIONAL WILDLIFE REFUGE (N.W.R.)/ NATIONAL SEASHORE/ NATIONAL WILDERNESS AREA (N.W.A.)
STATE RECREATIONAL AREA (S.R.A.)/STATE PARK/ STATE FISHING PIER/STATE LANDS/ STATE HISTORIC PARK/ STATE COMMEMORATIVE AREA (S.C.A.)/ STATE WILDLIFE REFUGE (S.W.R.)/ STATE WILDLIFE MANAGEMENT AREA (S.W.M.A.)/ STATE AQUATIC PRESERVE (S.A.P.)
NATIONAL AUDUBON SOCIETY SANCTUARIES
UNDERWATER DISTRICT
NATIONAL REGISTER SITE
0 5 10 kilometers
0 5 10 miles
Matchline Map 1
Matchline Map 3

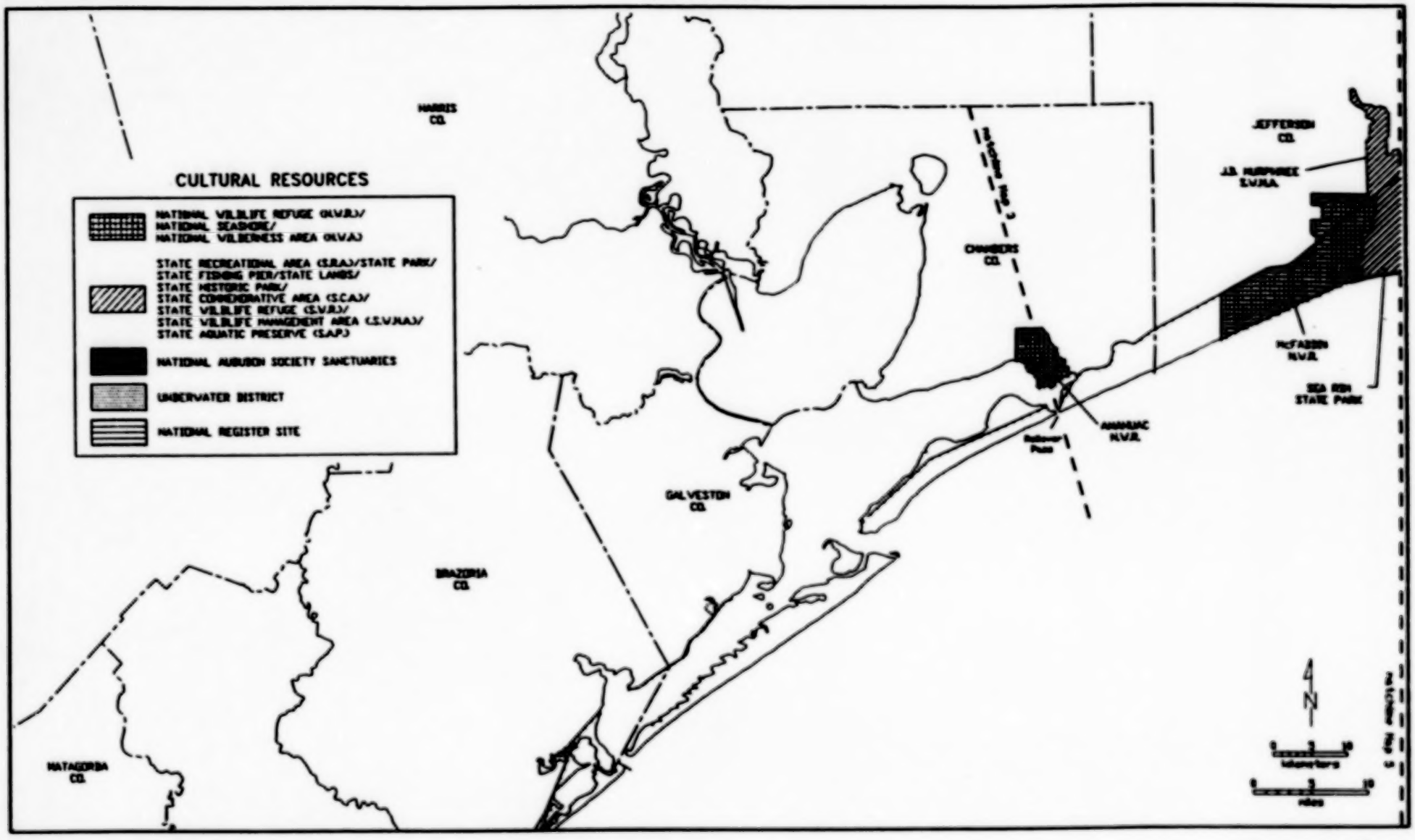
Map 2 - C

BAY CITY / HOUSTON



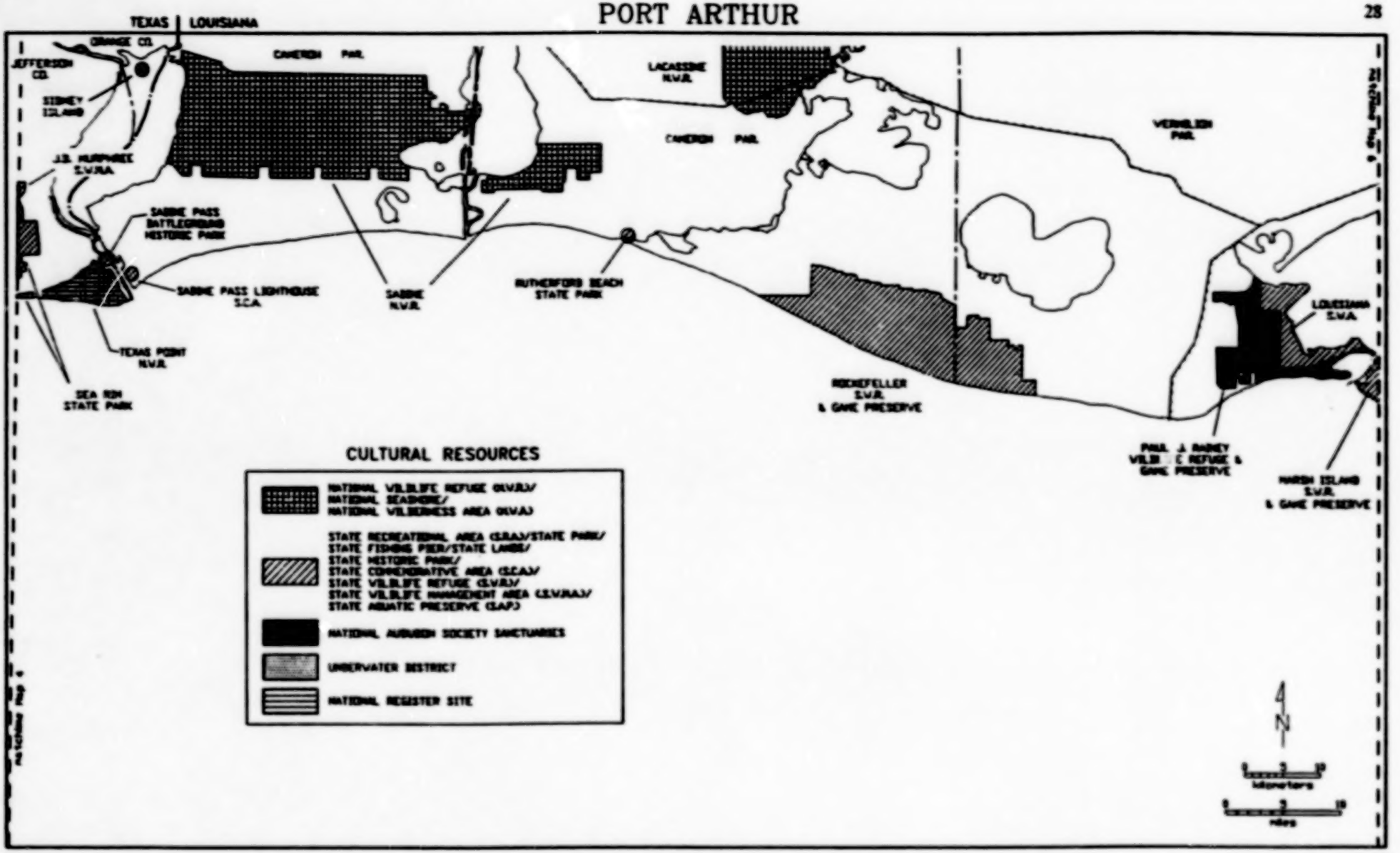
Map 3 - C

HOUSTON



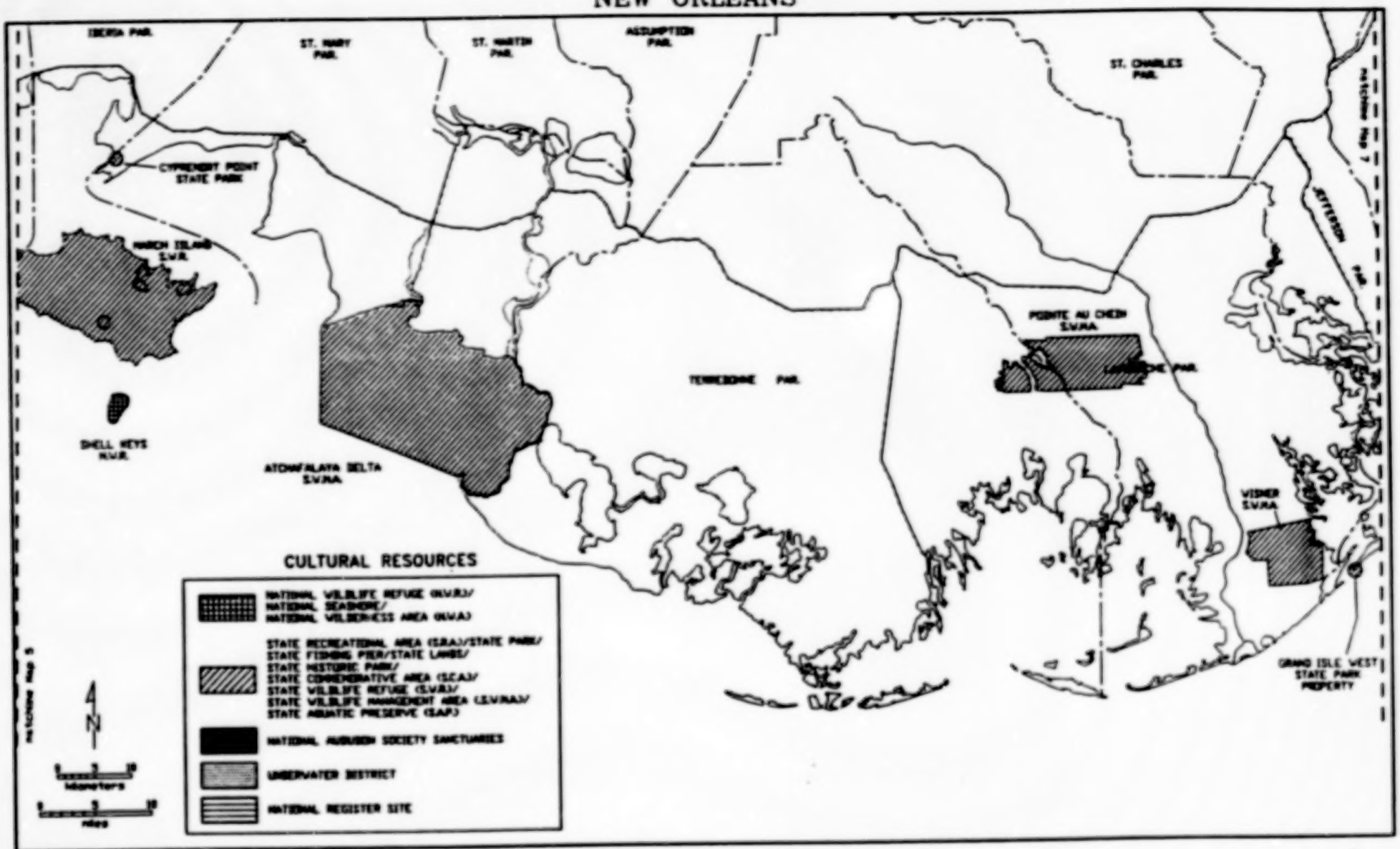
Map 4 - C

PORT ARTHUR

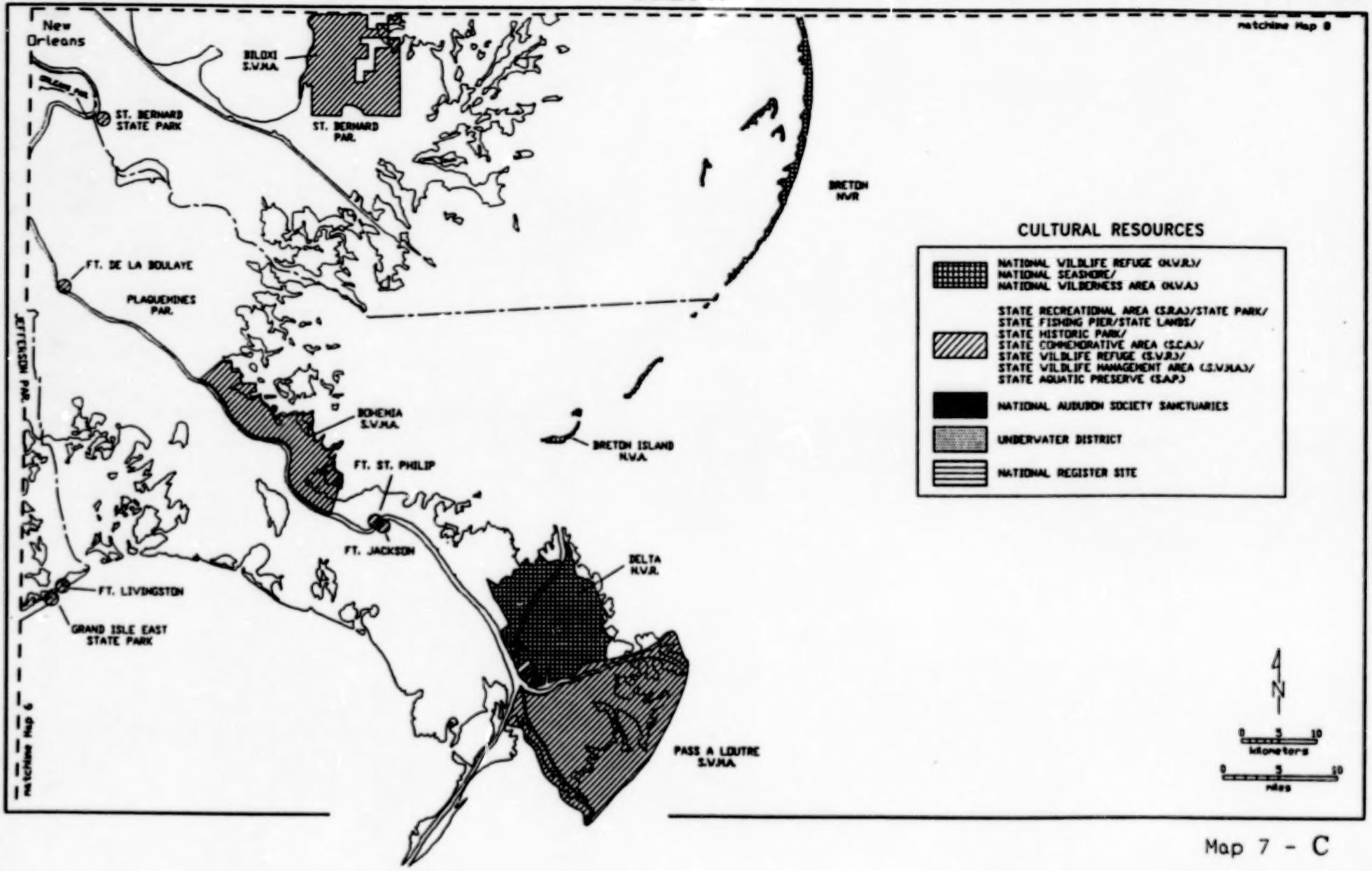


Map 5 - C

NEW ORLEANS

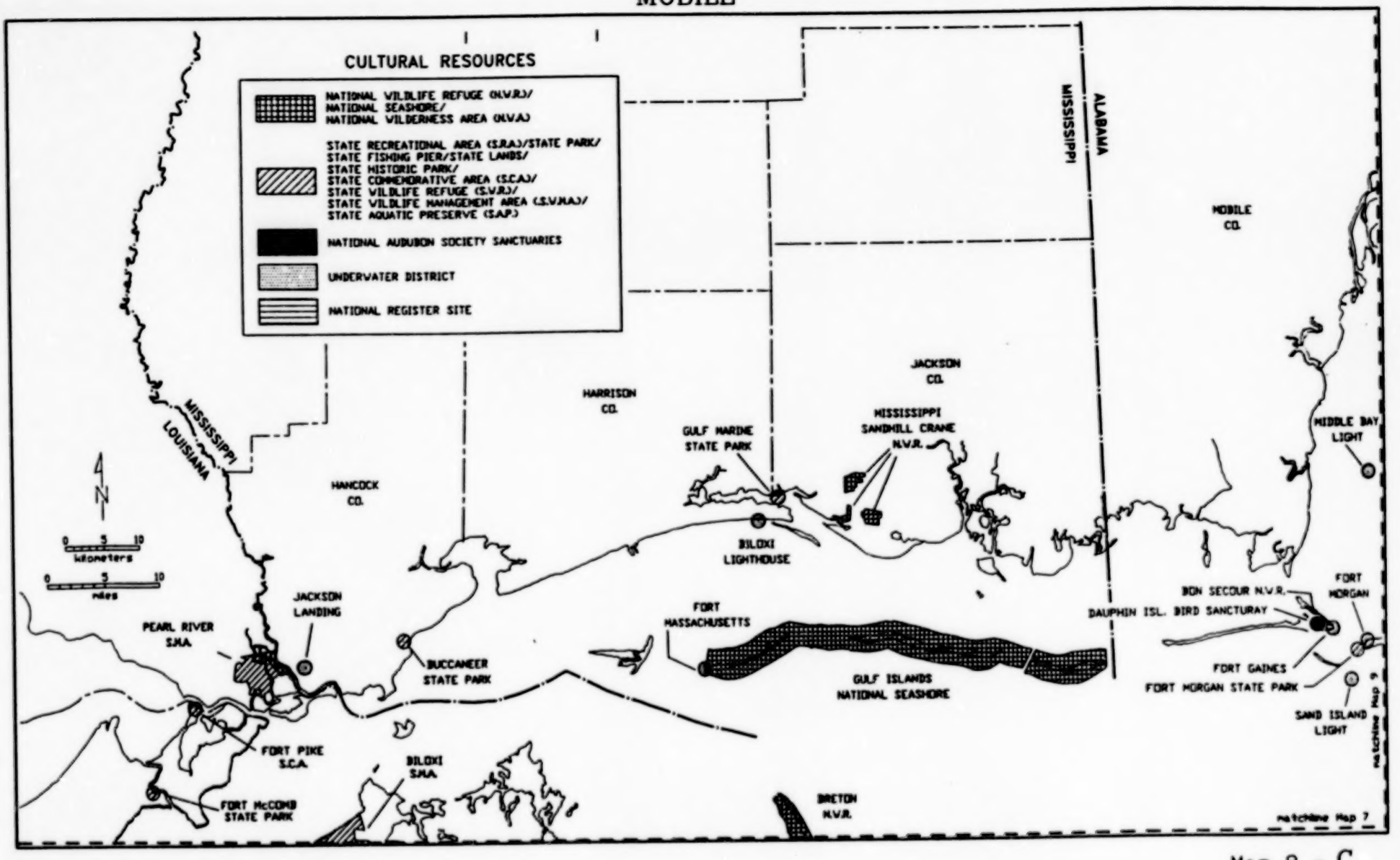


Map 6 - C


New Orleans
BILOXI S.V.M.A.
ST. BERNARD STATE PARK
ST. BERNARD PAR.
BRETON N.W.R.
FT. DE LA BOULAYE
PLAQUEMINES PAR.
JEFFERSON PAR.
BOHEMIA S.V.M.A.
BRETON ISLAND N.W.A.
FT. ST. PHILIP
FT. JACKSON
DELTA N.W.R.
FT. LIVINGSTON
GRAND ISLE EAST STATE PARK
PASS A LOUTRE S.W.M.A.
matchline Map 6
matchline Map 8
CULTURAL RESOURCES
NATIONAL WILDLIFE REFUGE (N.W.R.)/
NATIONAL SEASHORE/
NATIONAL WILDERNESS AREA (N.W.A.)
STATE RECREATIONAL AREA (S.R.A.)/STATE PARK/
STATE FISHING PIER/STATE LANDS/
STATE HISTORIC PARK/
STATE COMMEMORATIVE AREA (S.C.A.)/
STATE WILDLIFE REFUGE (S.W.R.)/
STATE WILDLIFE MANAGEMENT AREA (S.W.M.A.)/
STATE AQUATIC PRESERVE (S.A.P.)
NATIONAL AUDUBON SOCIETY SANCTUARIES
UNDERWATER DISTRICT
NATIONAL REGISTER SITE
N
0 5 10
kilometers
0 5 10
miles

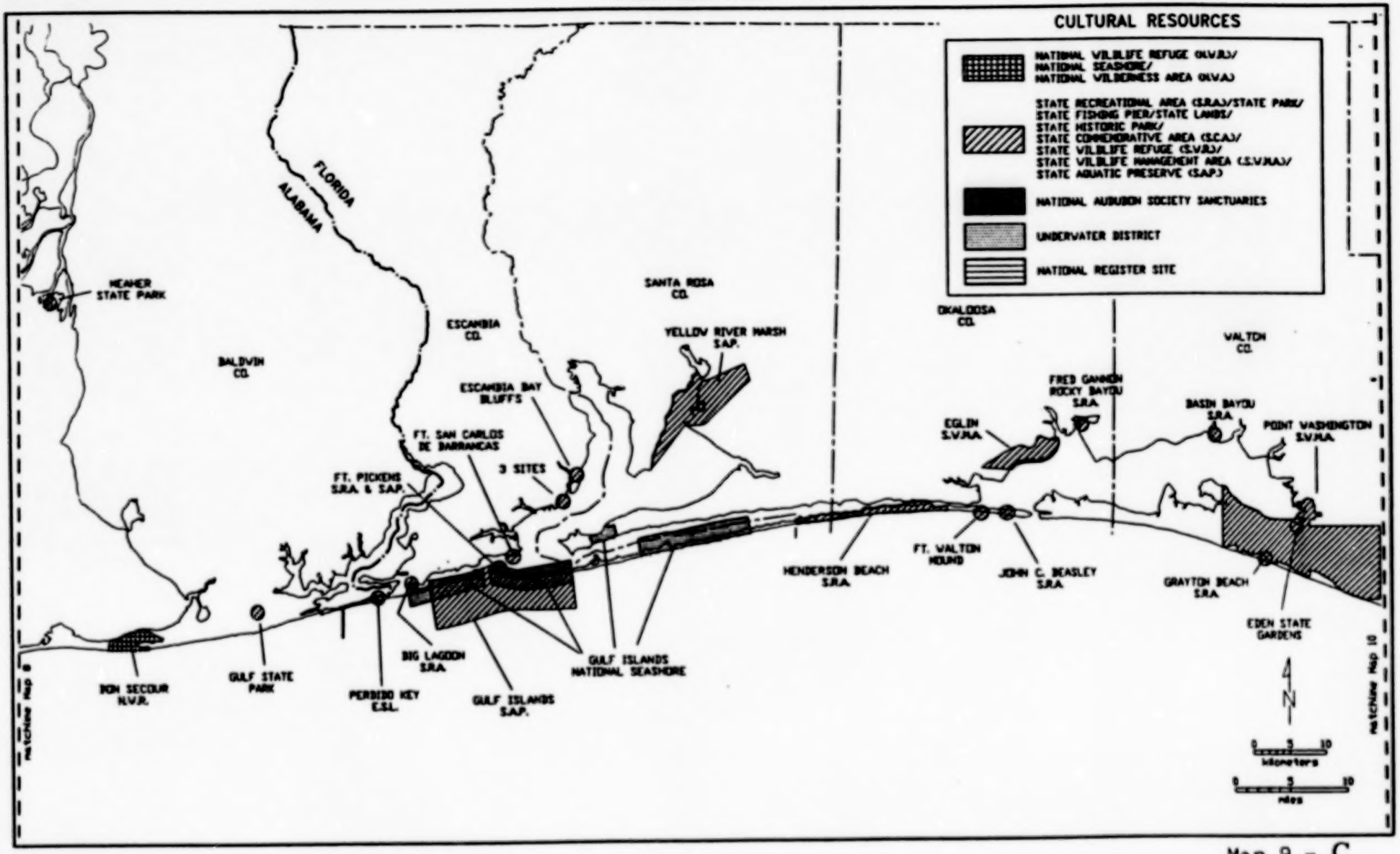
Map 7 - C

MOBILE



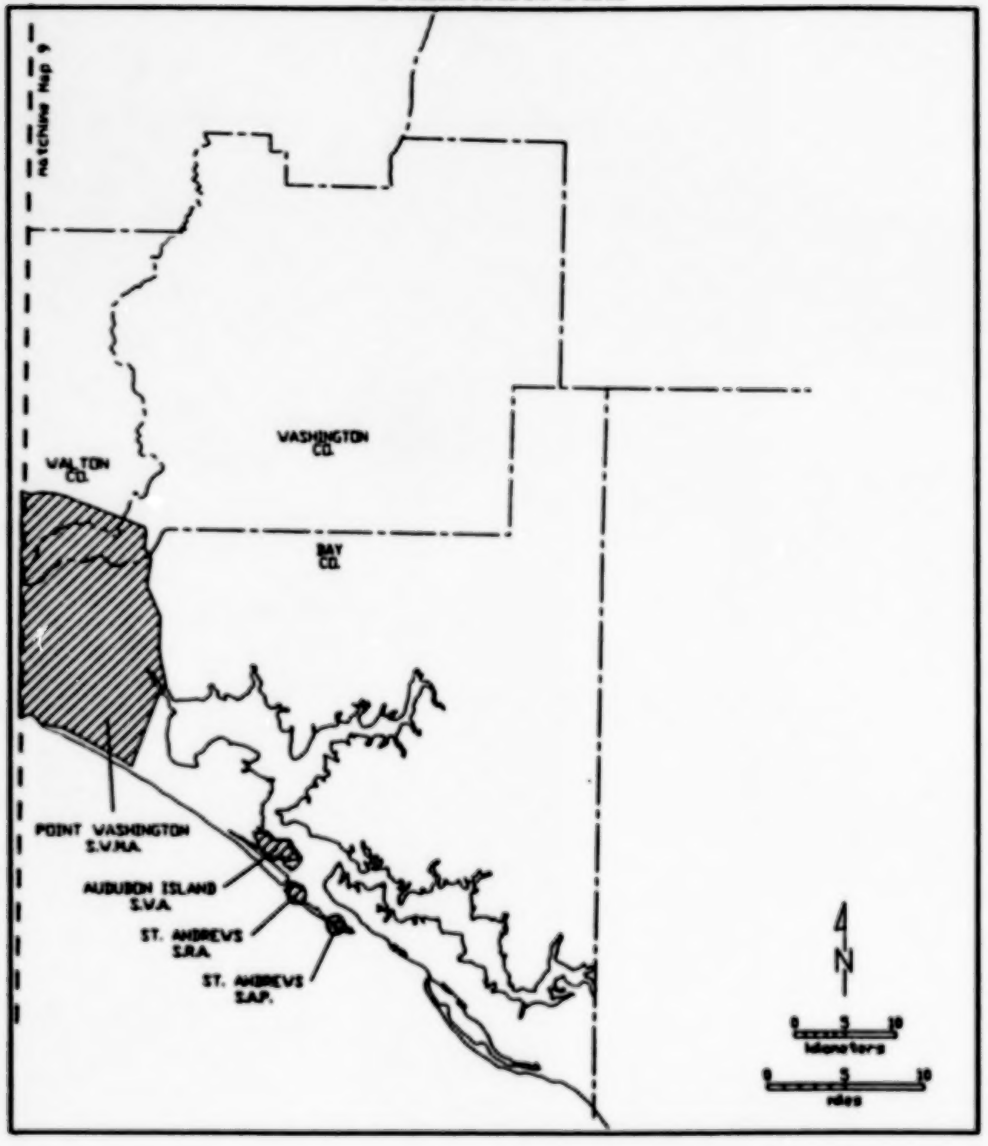
Map 8 - C

PENSACOLA



Map 9 - C

TALLAHASSEE



Map 10 - C

CULTURAL RESOURCES

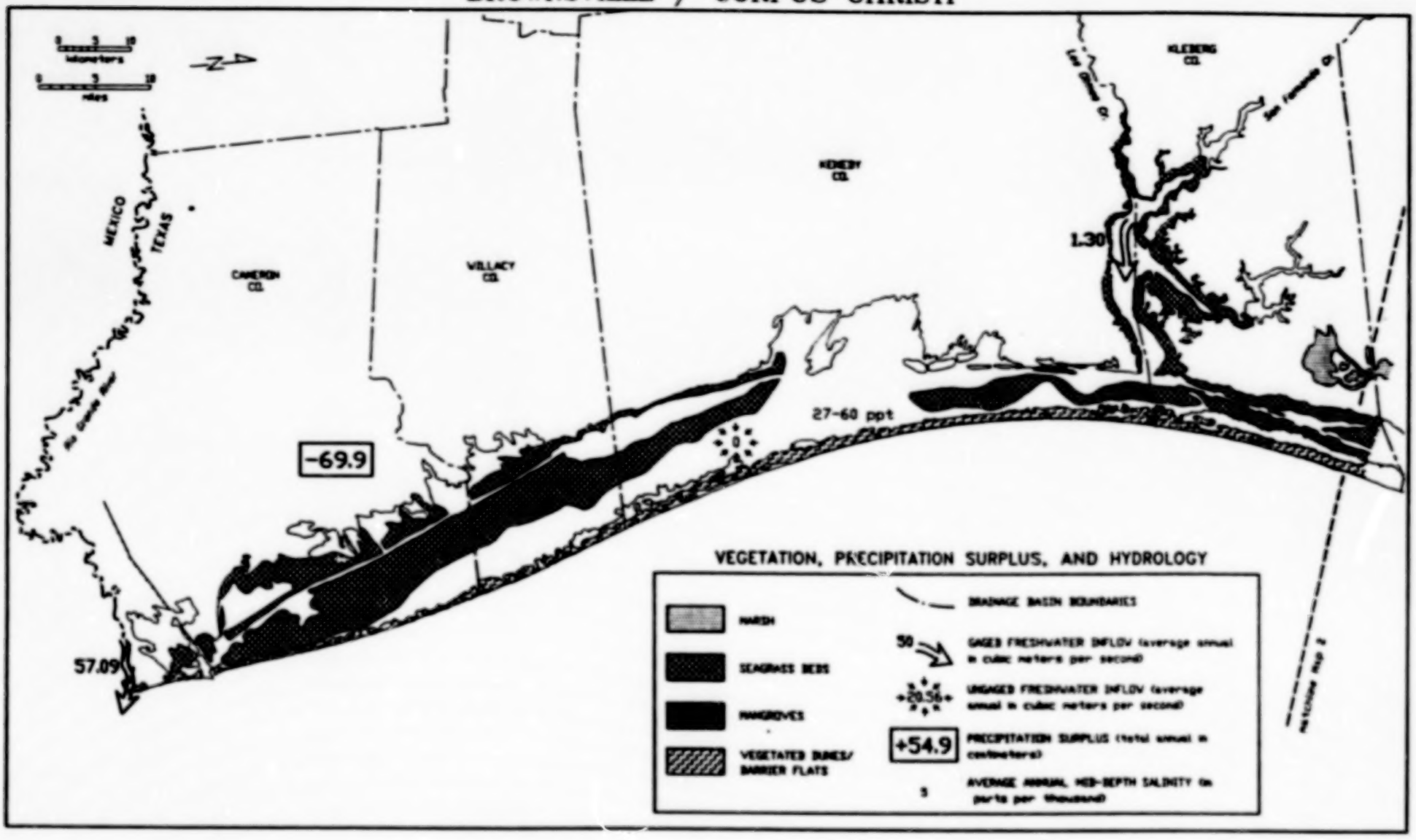
- NATIONAL WILDLIFE REFUGE (N.W.R.)/ NATIONAL SEASHORE/ NATIONAL WILDERNESS AREA (N.W.A.)
- STATE RECREATIONAL AREA (S.R.A.)/STATE PARK/ STATE FISHING PIER/STATE LANDS/ STATE HISTORIC PARK/ STATE COMMEMORATIVE AREA (S.C.A.)/ STATE WILDLIFE REFUGE (S.W.R.)/ STATE WILDLIFE MANAGEMENT AREA (S.W.M.A.)/ STATE AQUATIC PRESERVE (S.A.P.)
- NATIONAL AUDUBON SOCIETY SANCTUARIES
- UNDERWATER DISTRICT
- NATIONAL REGISTER SITE

34

Maps 1D - 10D

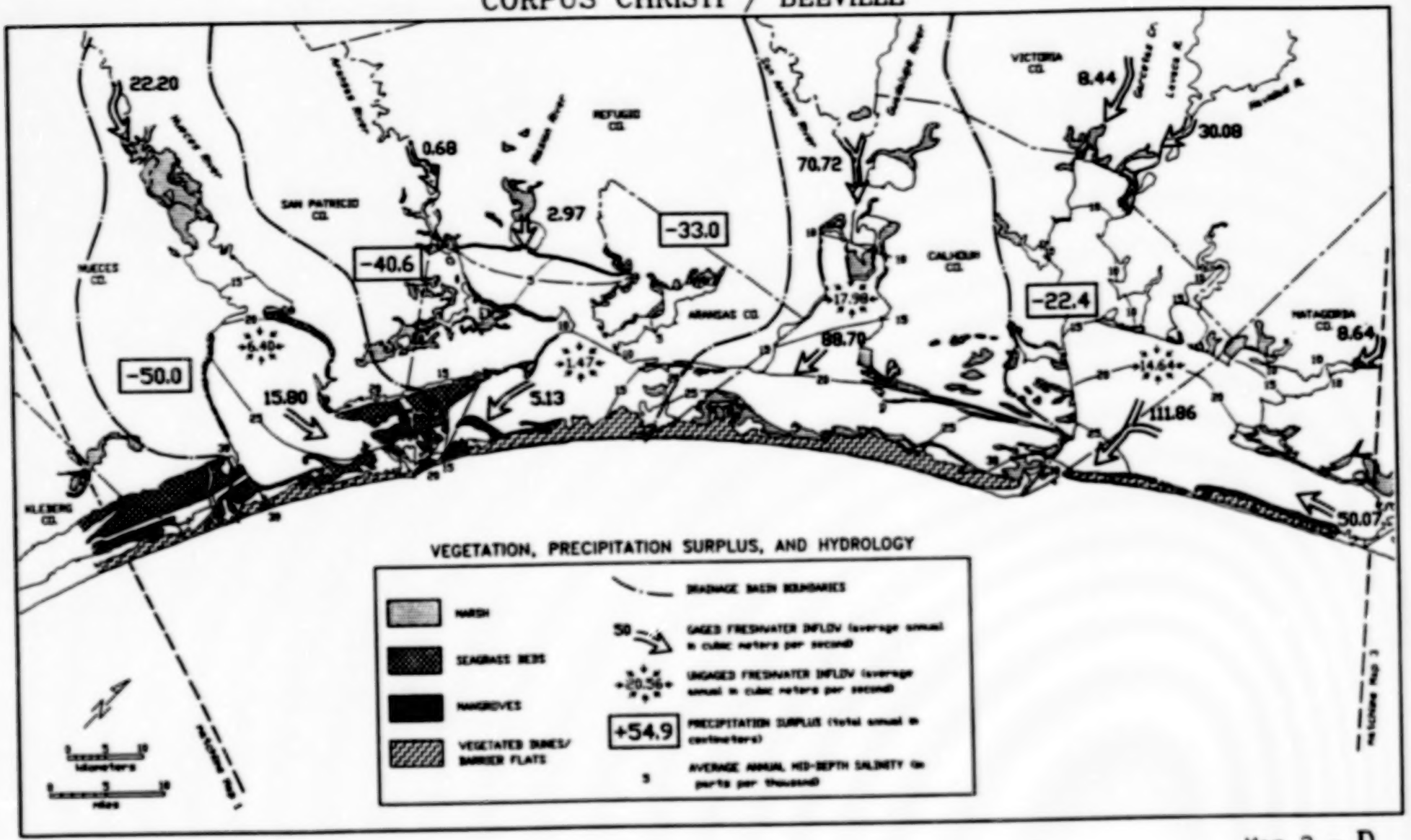
VEGETATION, PRECIPITATION SURPLUS, AND HYDROLOGY

BROWNSVILLE / CORPUS CHRISTI



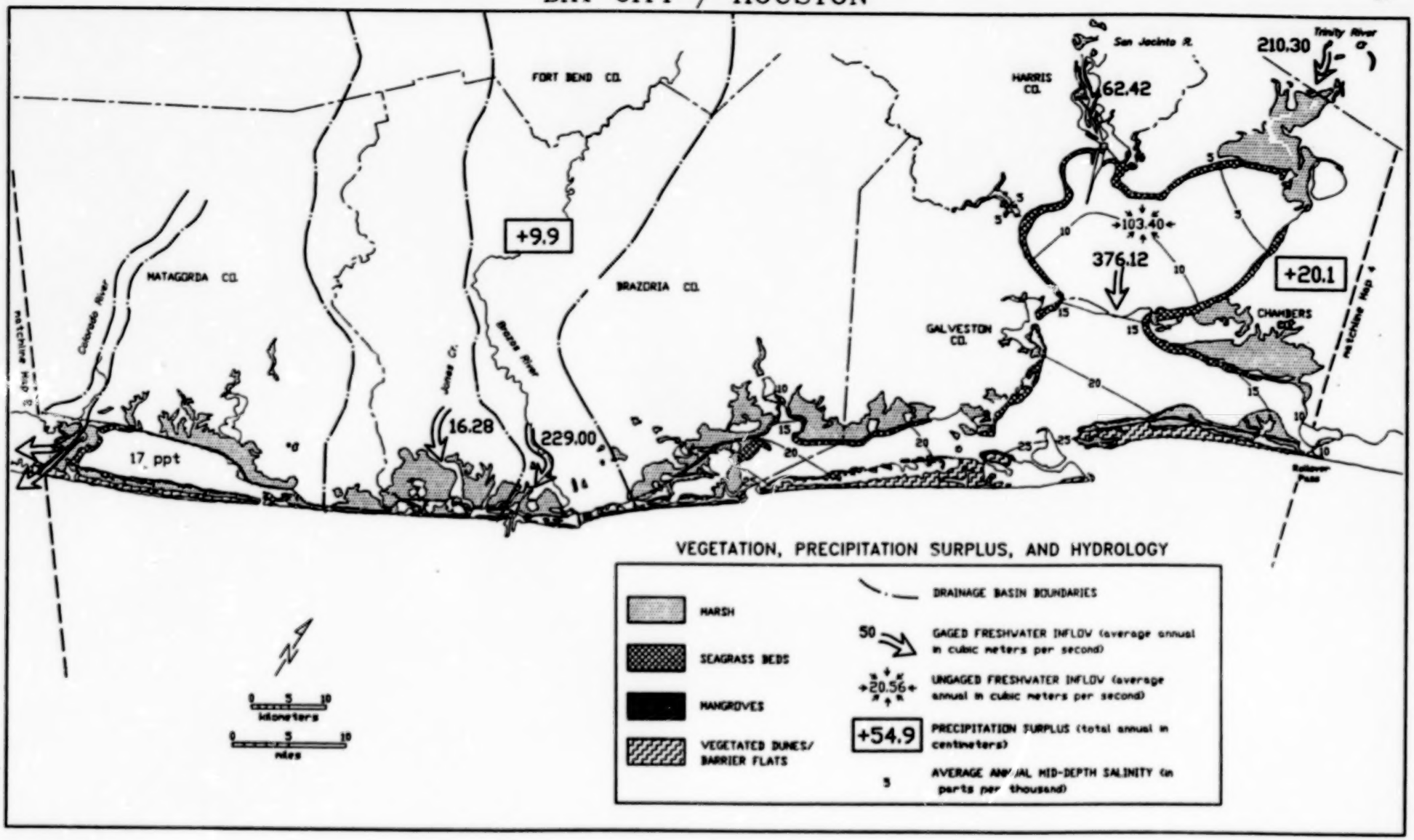
Map 1 - D

CORPUS CHRISTI / BEEVILLE



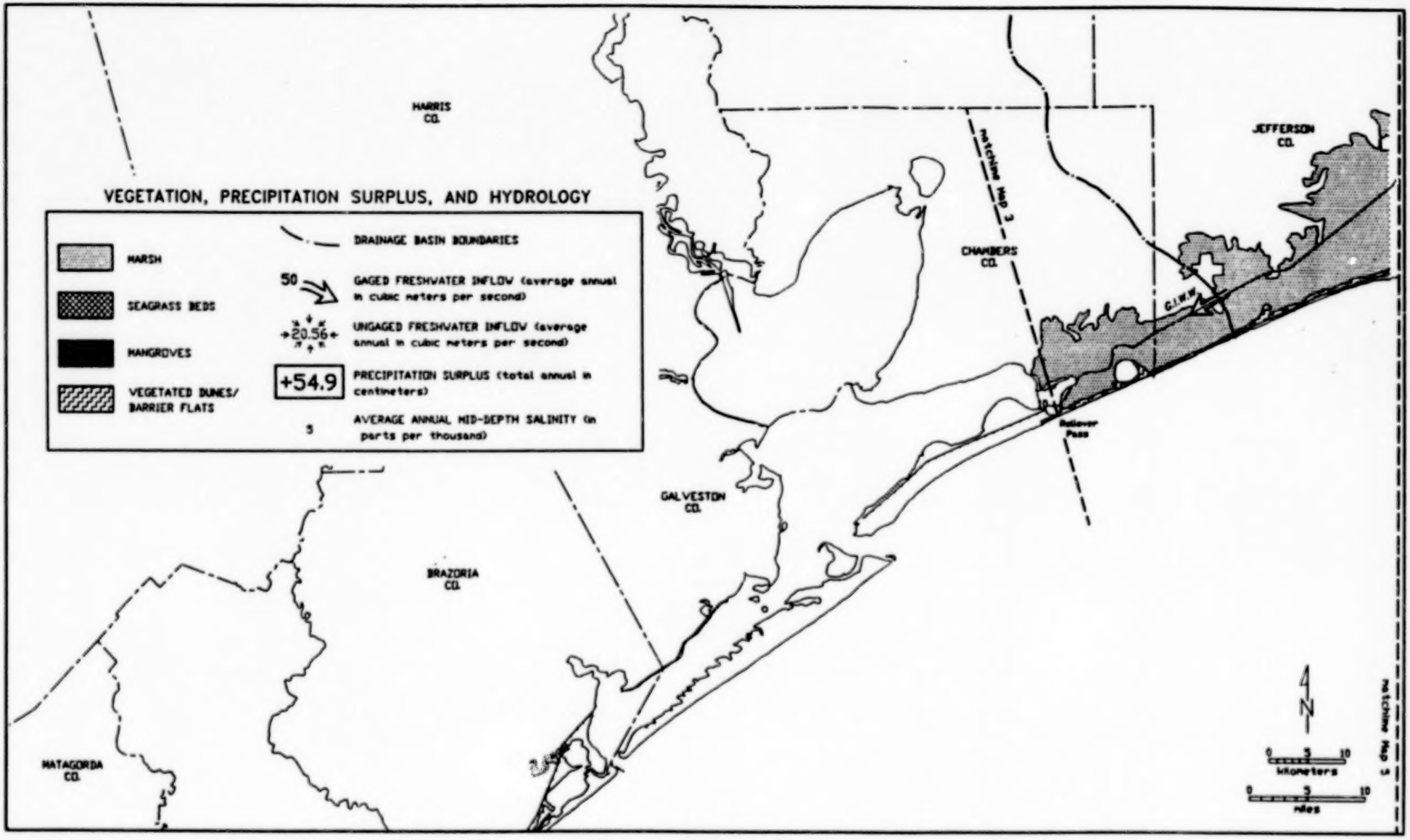
Map 2 - D

BAY CITY / HOUSTON



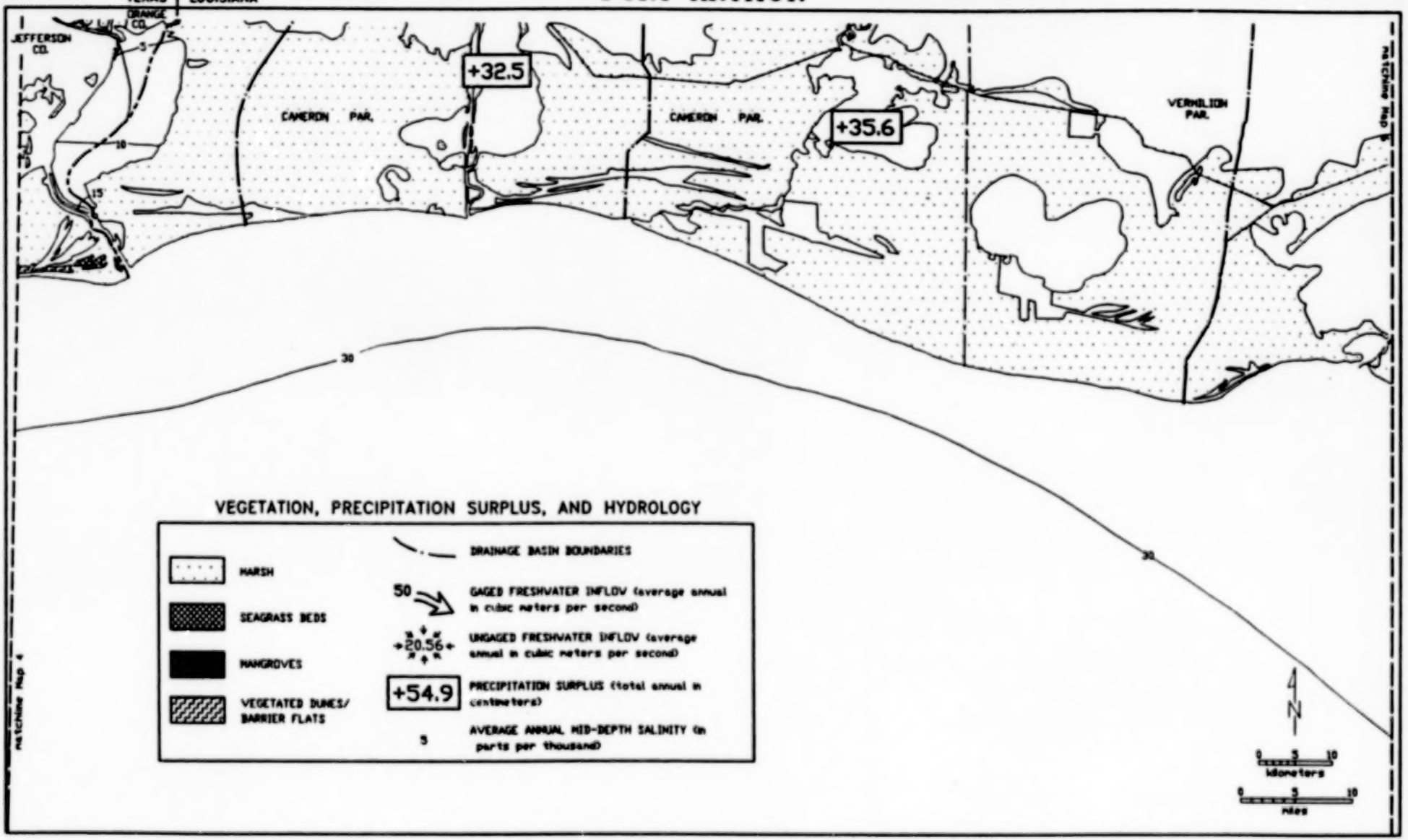
Map 3 - D

HOUSTON

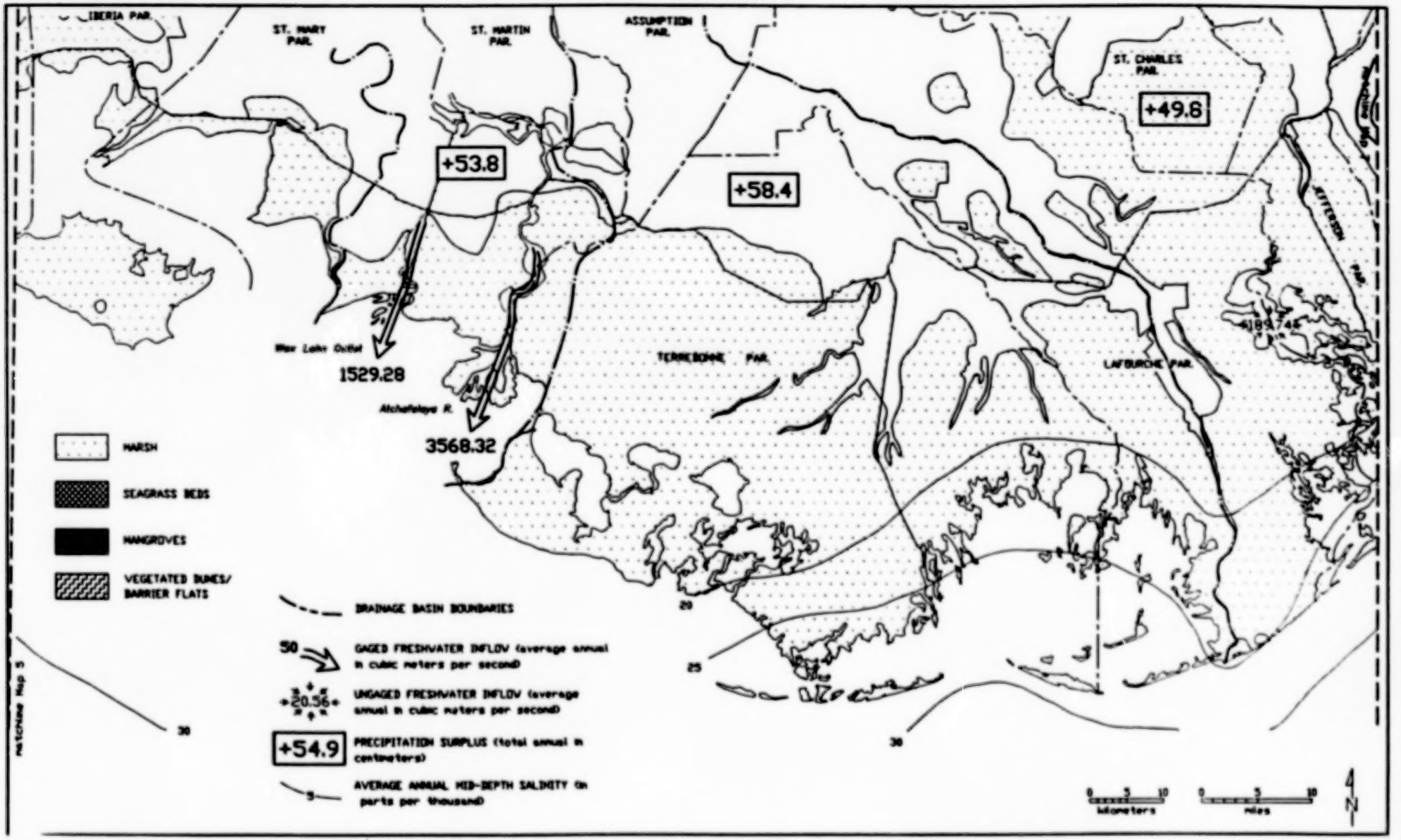


Map 4 - D

PORT ARTHUR



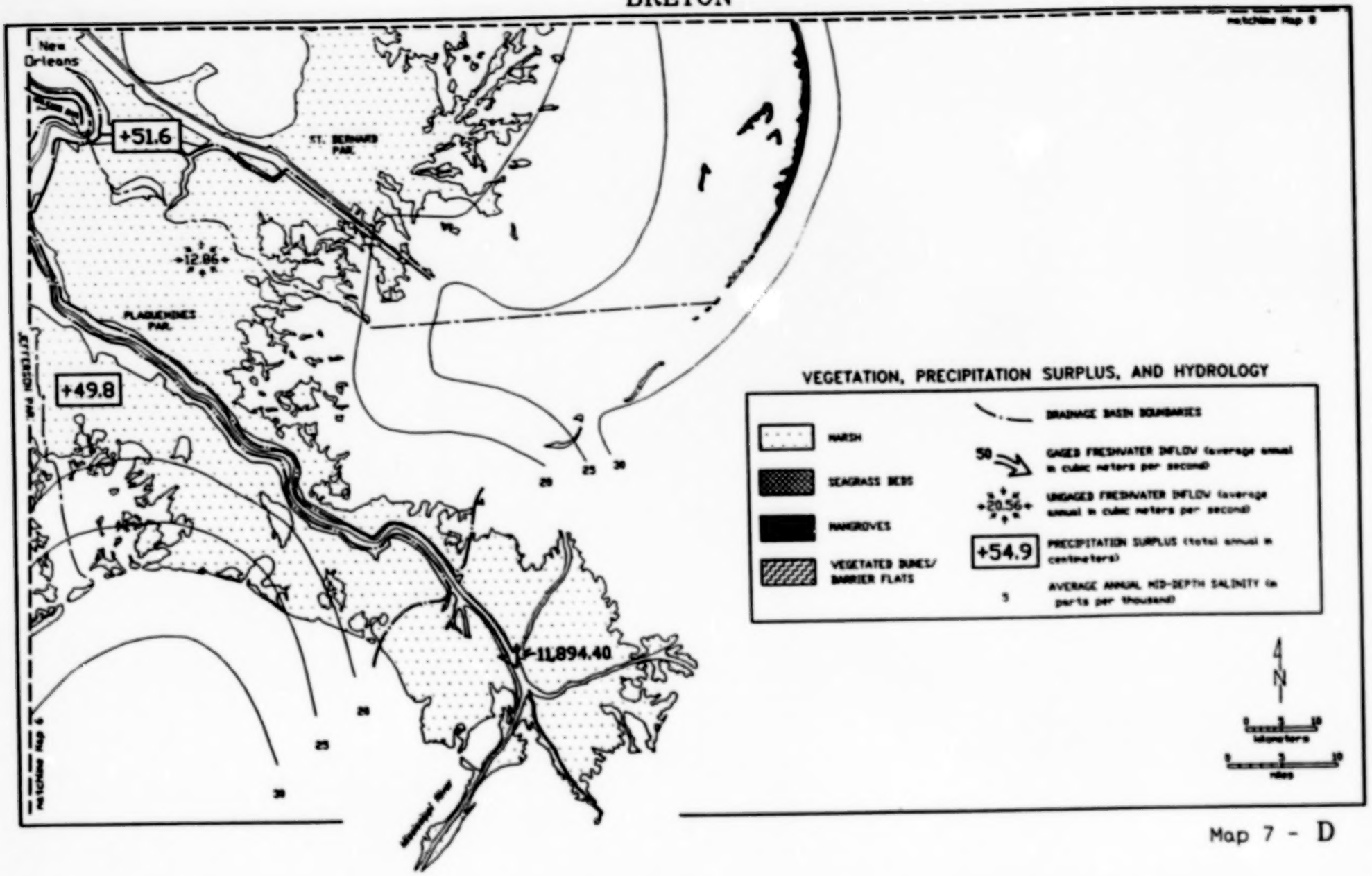
Map 5 - D



VEGETATION, PRECIPITATION SURPLUS, AND HYDROLOGY

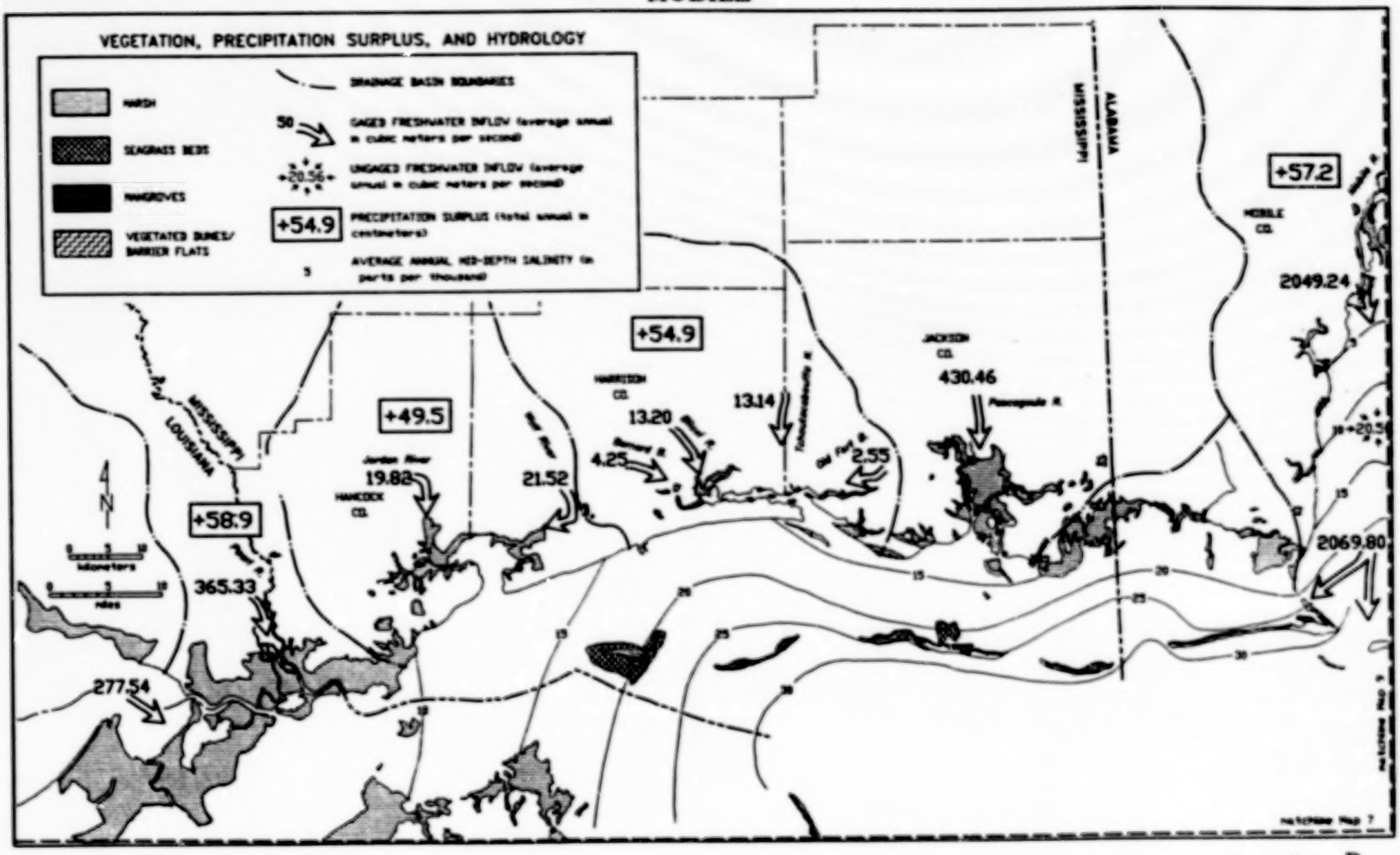
Map 6 - D

BRETON



Map 7 - D

MOBILE

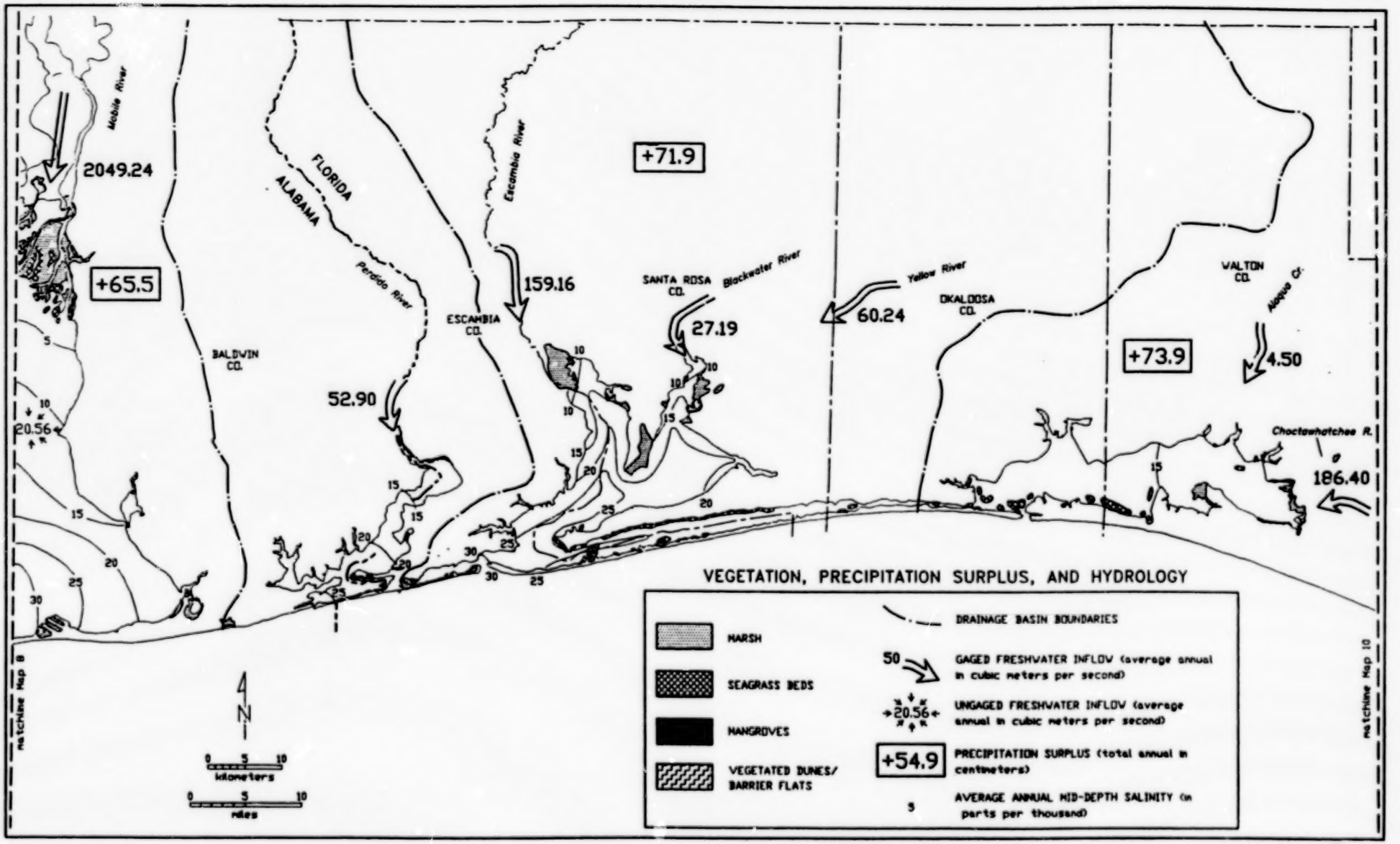


Map 8 - D

BLANK

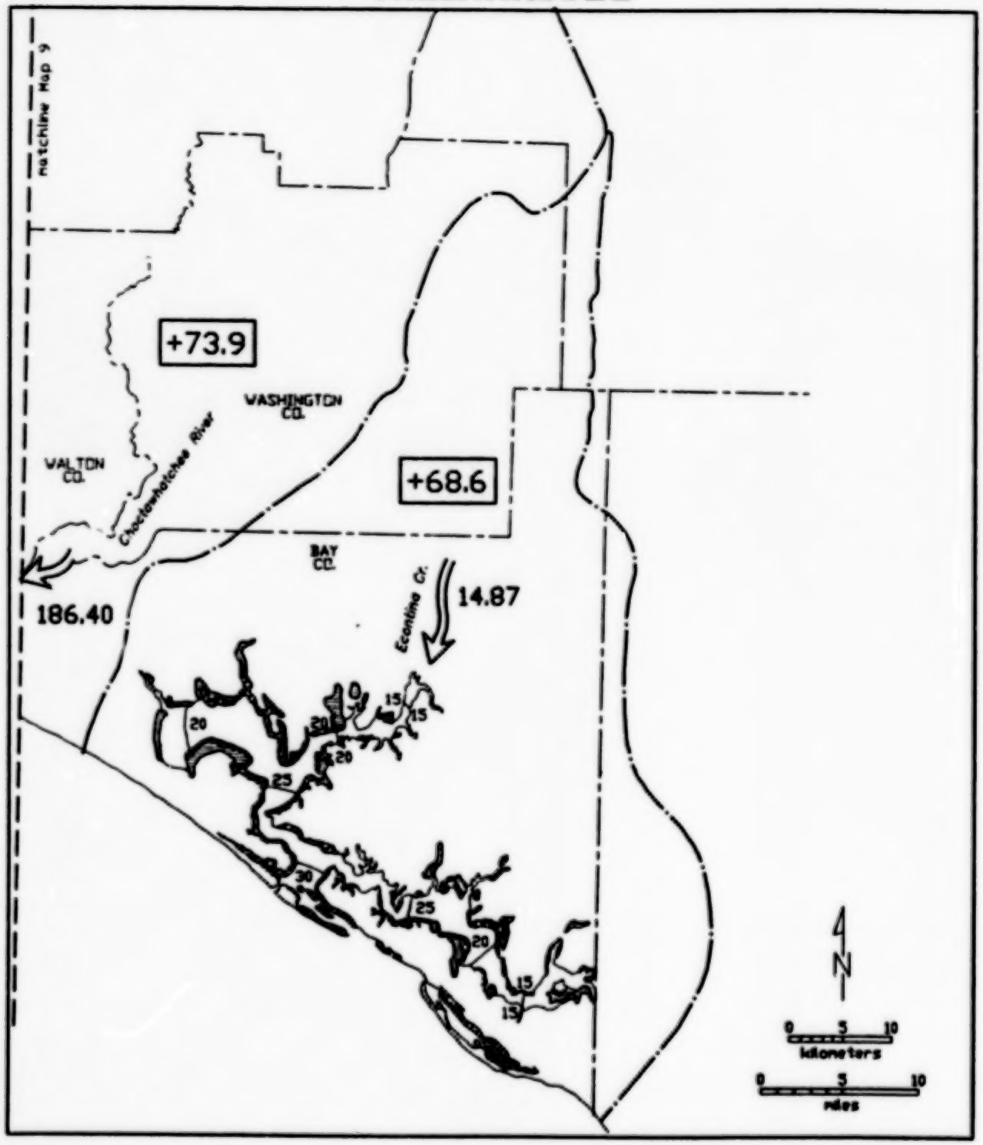
PAGE

PENSACOLA



Map 9 - D

TALLAHASSEE



Map 10 - D

VEGETATION, PRECIPITATION SURPLUS, AND HYDROLOGY

MARSH

SEAGRASS BEDS

MANGROVES

VEGETATED DUNES/ BARRIER FLATS

DRAINAGE BASIN BOUNDARIES

50 GAGED FRESHWATER INFLOW (average annual in cubic meters per second)

20.56 UNGAGED FRESHWATER INFLOW (average annual in cubic meters per second)

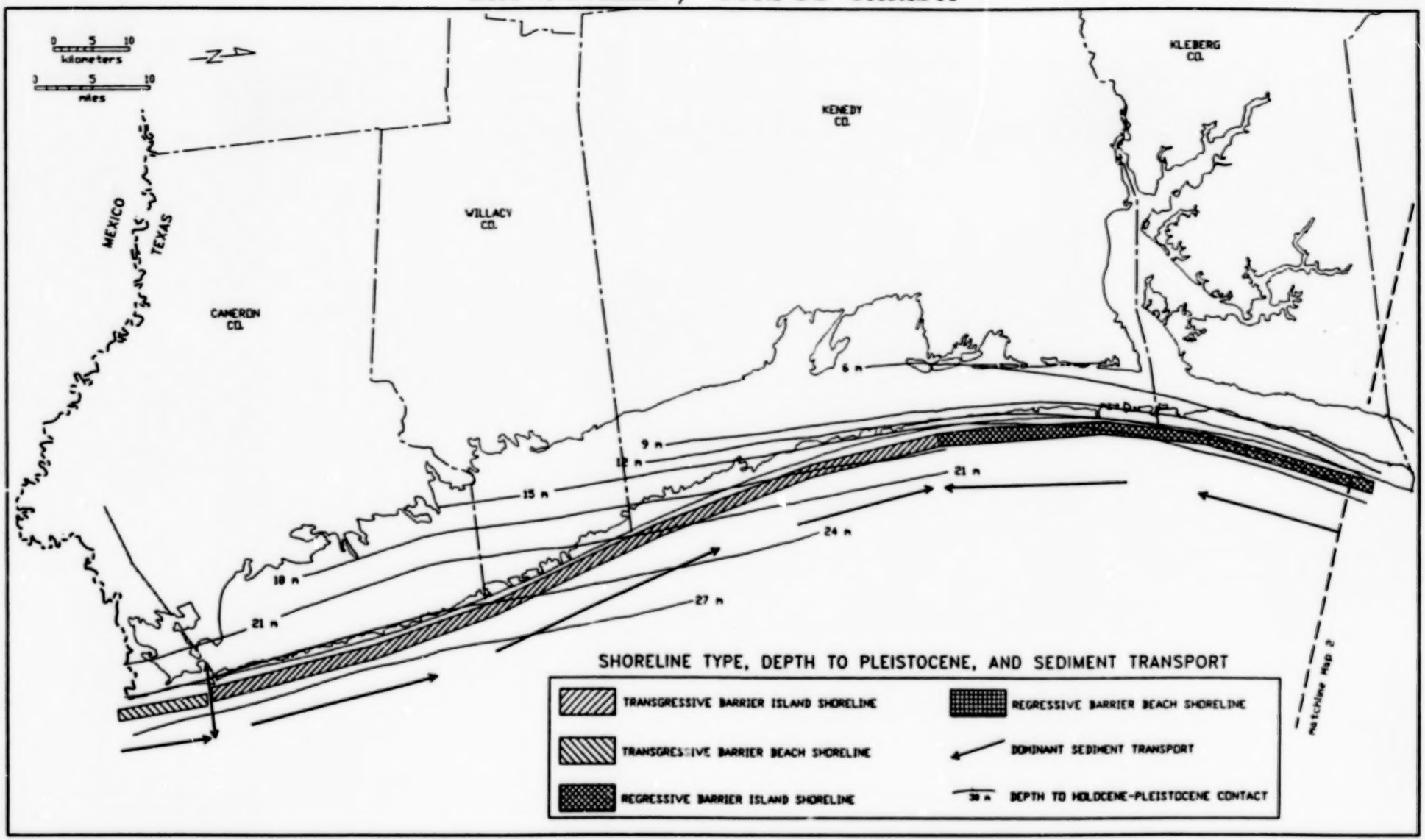
+54.9 PRECIPITATION SURPLUS (total annual in centimeters)

5 AVERAGE ANNUAL MID-DEPTH SALINITY (in parts per thousand)

Maps 1E - 10E

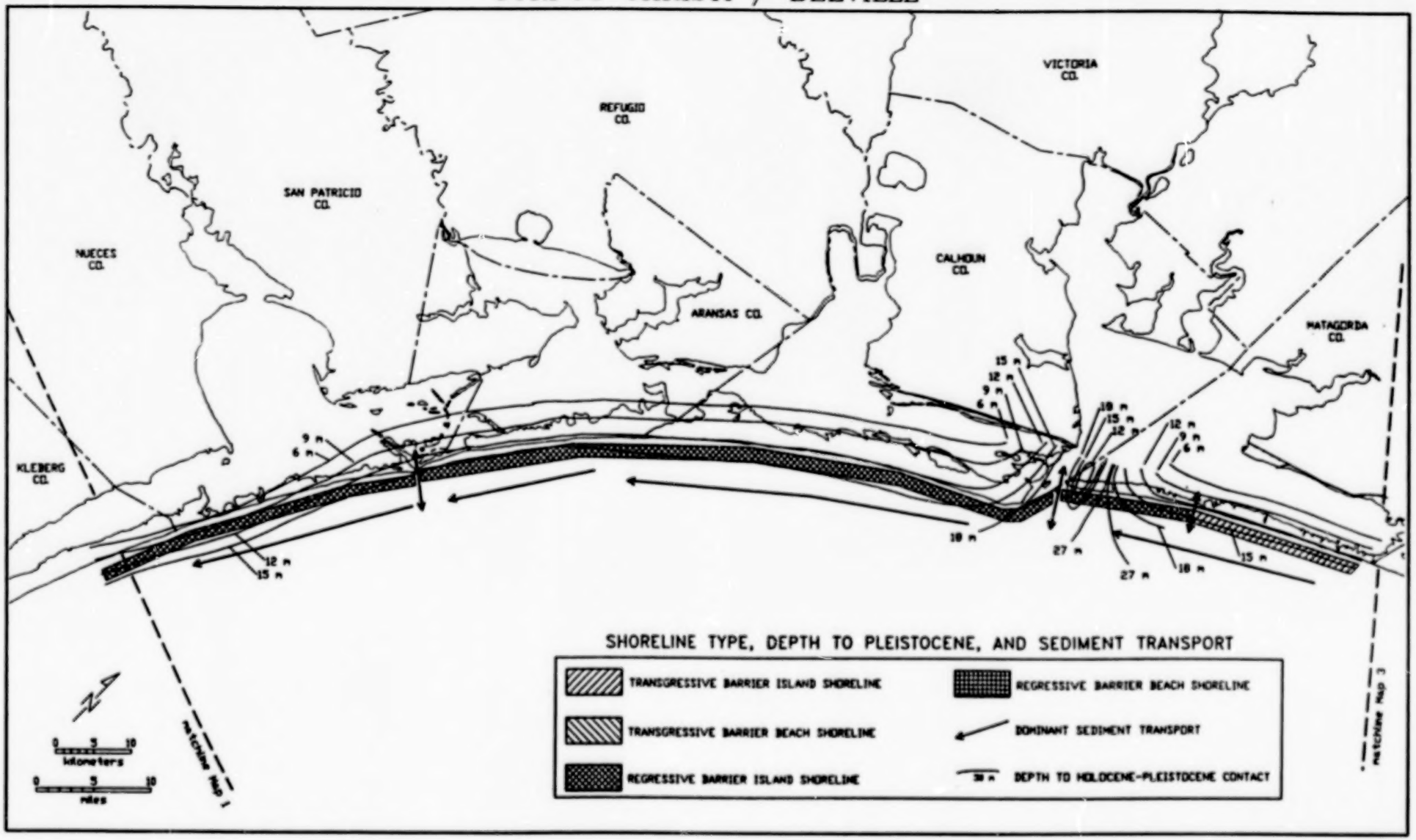
SHORELINE TYPE, DEPTH TO PLEISTOCENE, AND SEDIMENT TRANSPORT

BROWNSVILLE / CORPUS CHRISTI



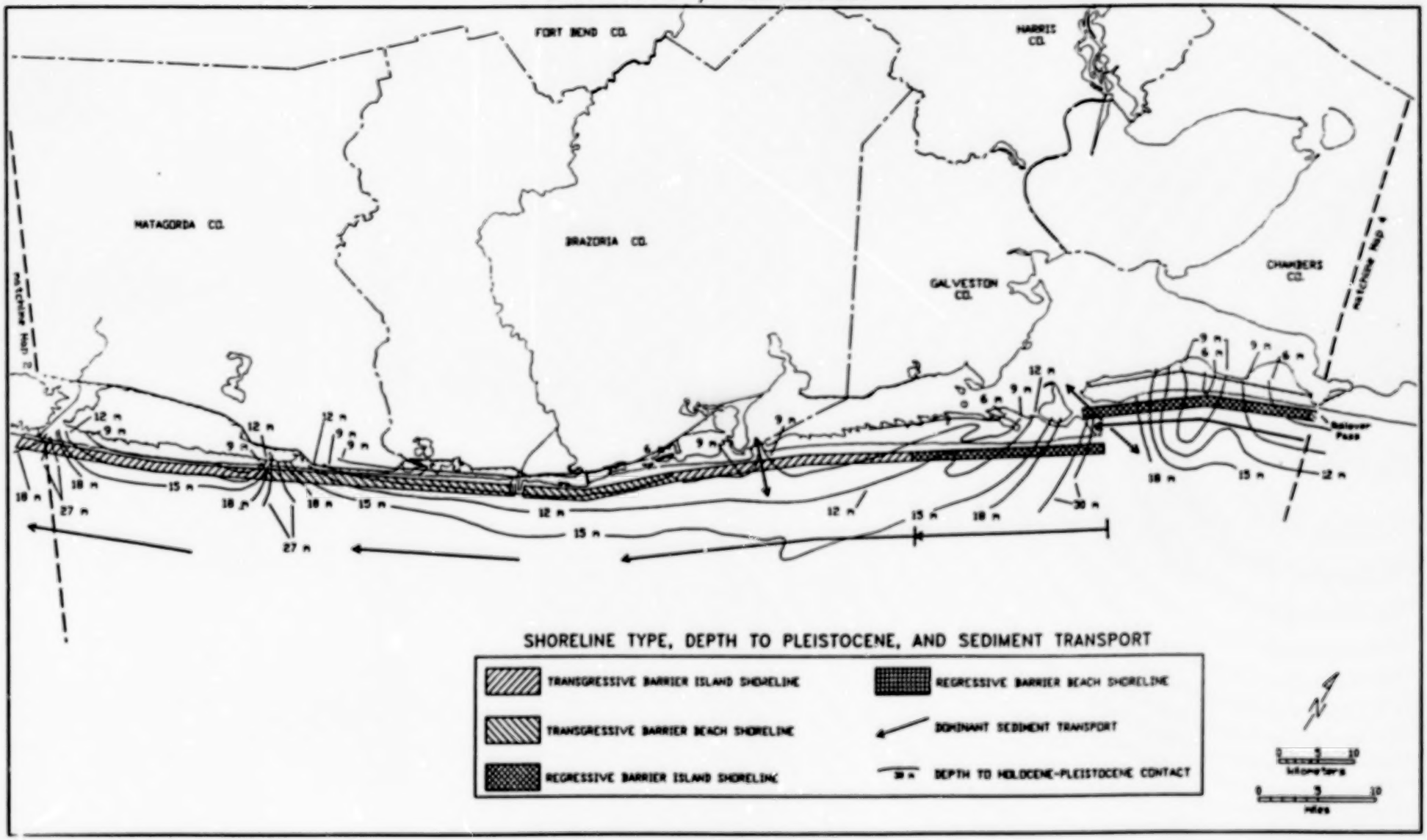
Map 1 - E

CORPUS CHRISTI / BEEVILLE



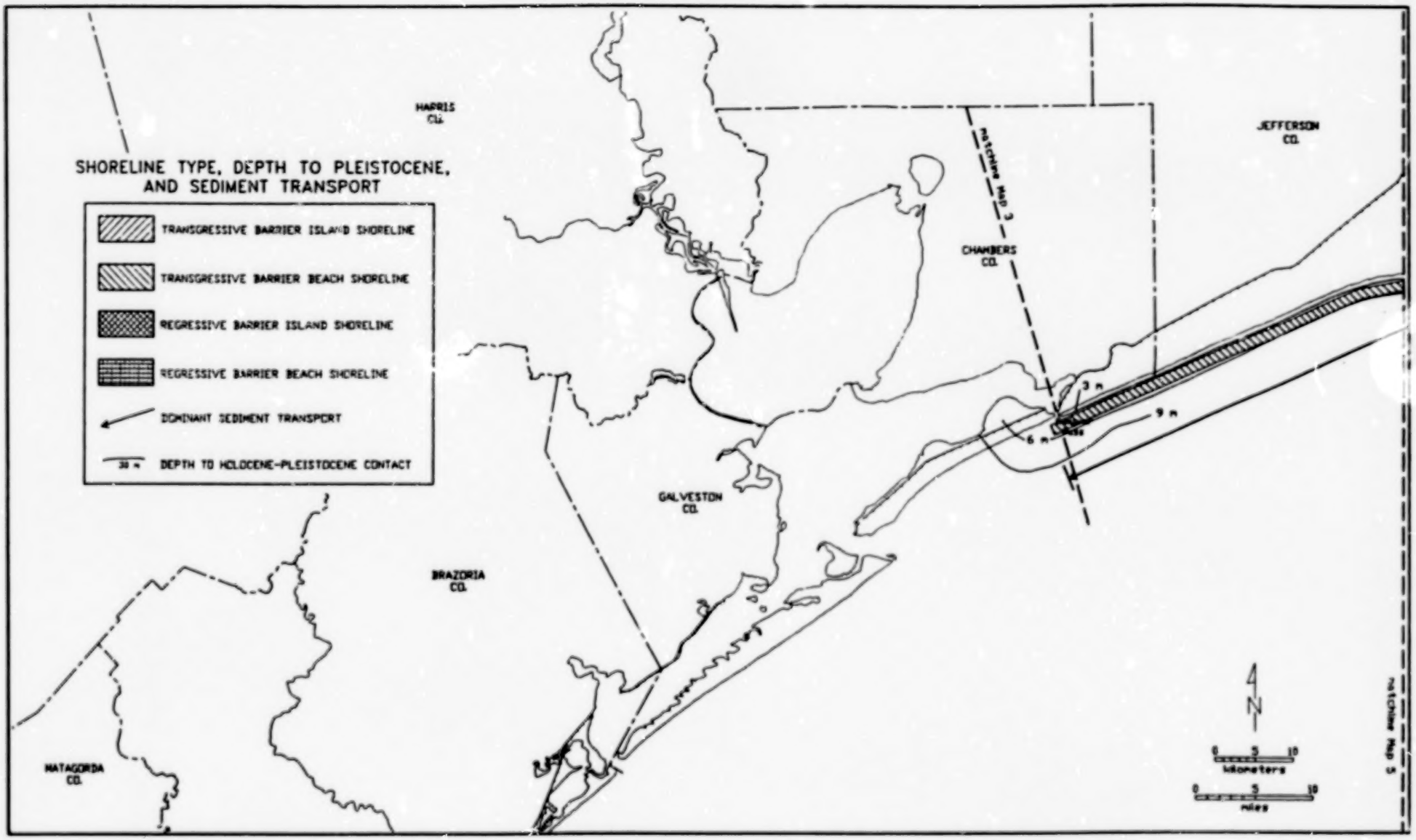
Map 2 - E

BAY CITY / HOUSTON



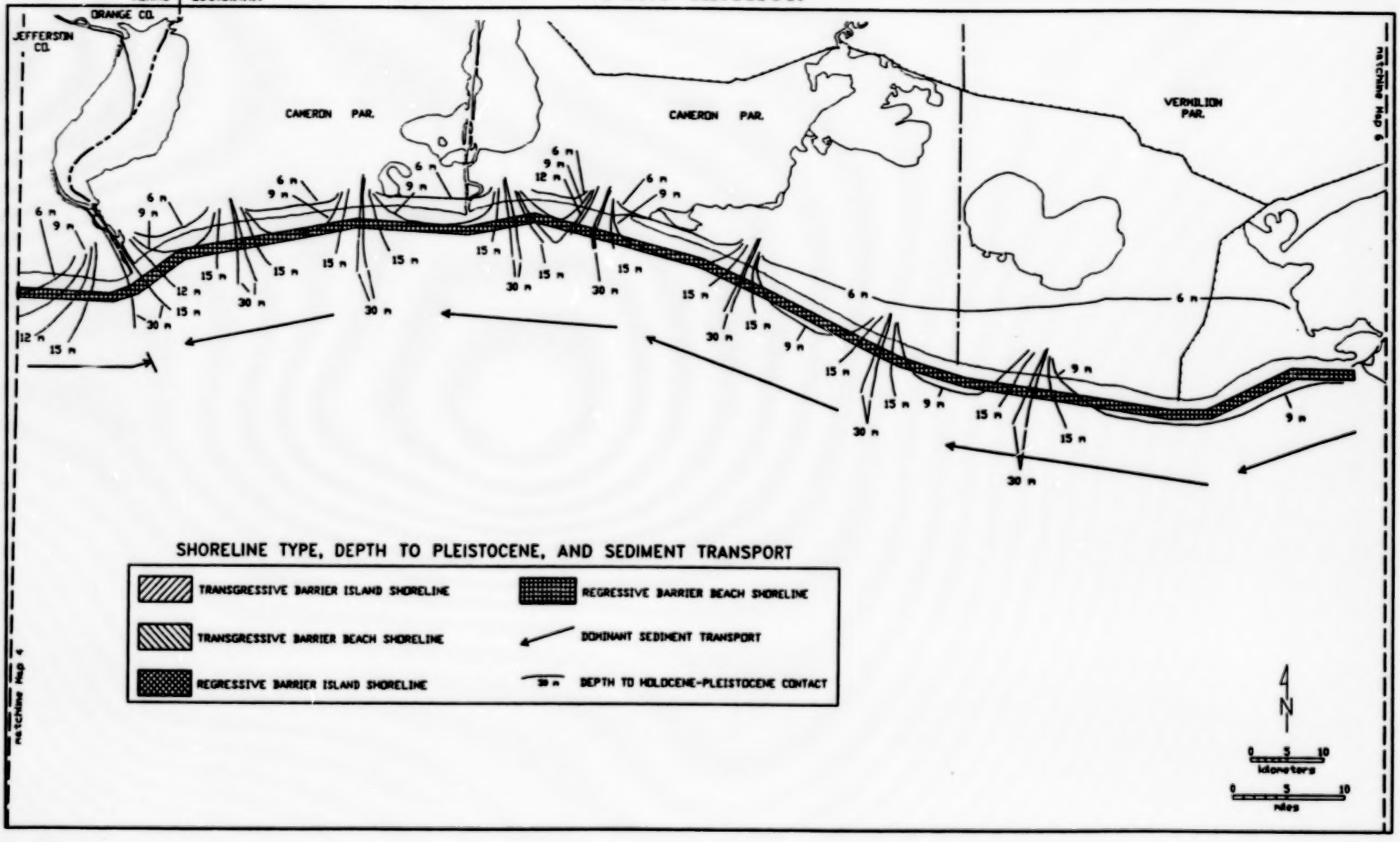
Map 3 - E

HOUSTON



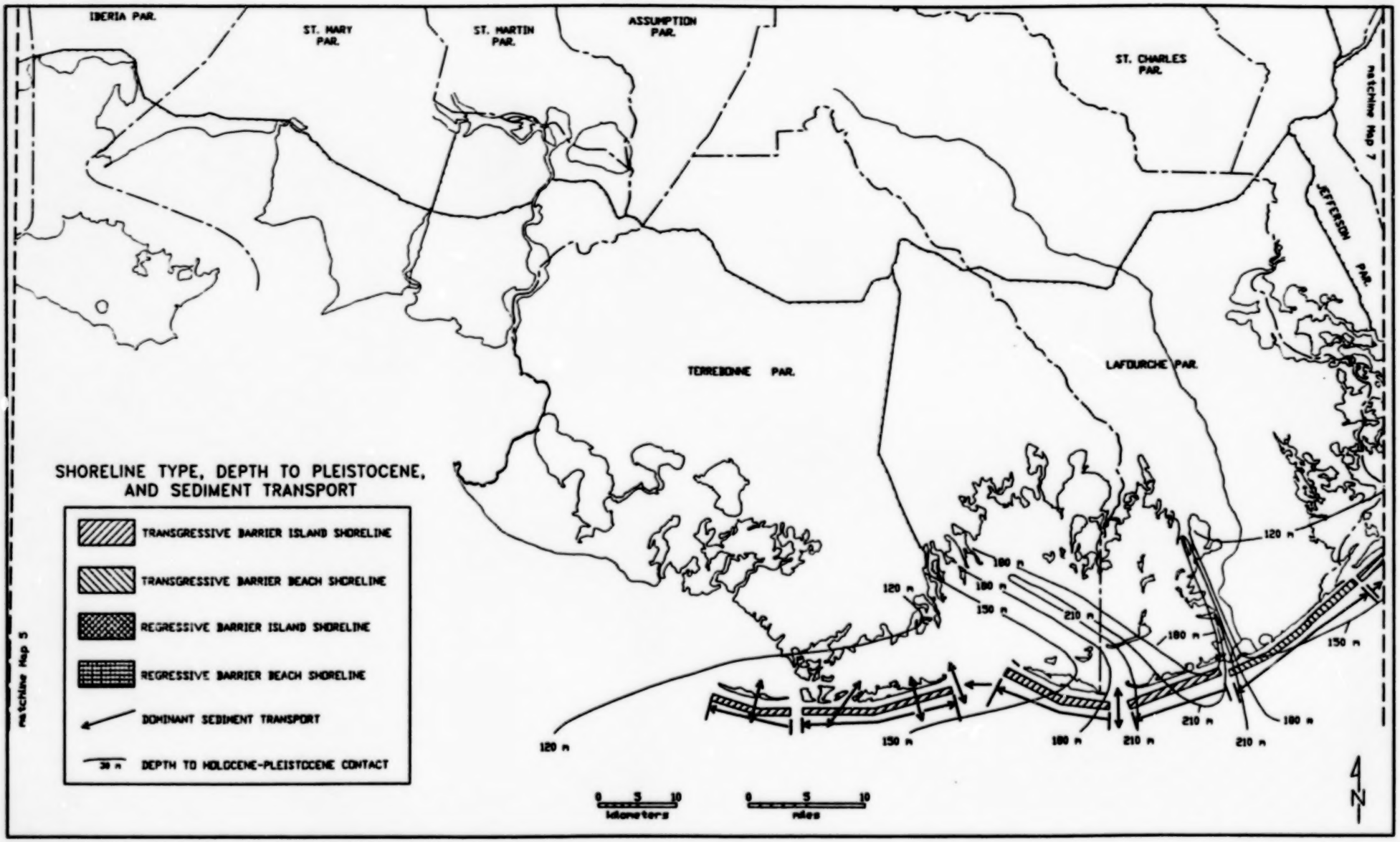
Map 4 - E

PORT ARTHUR

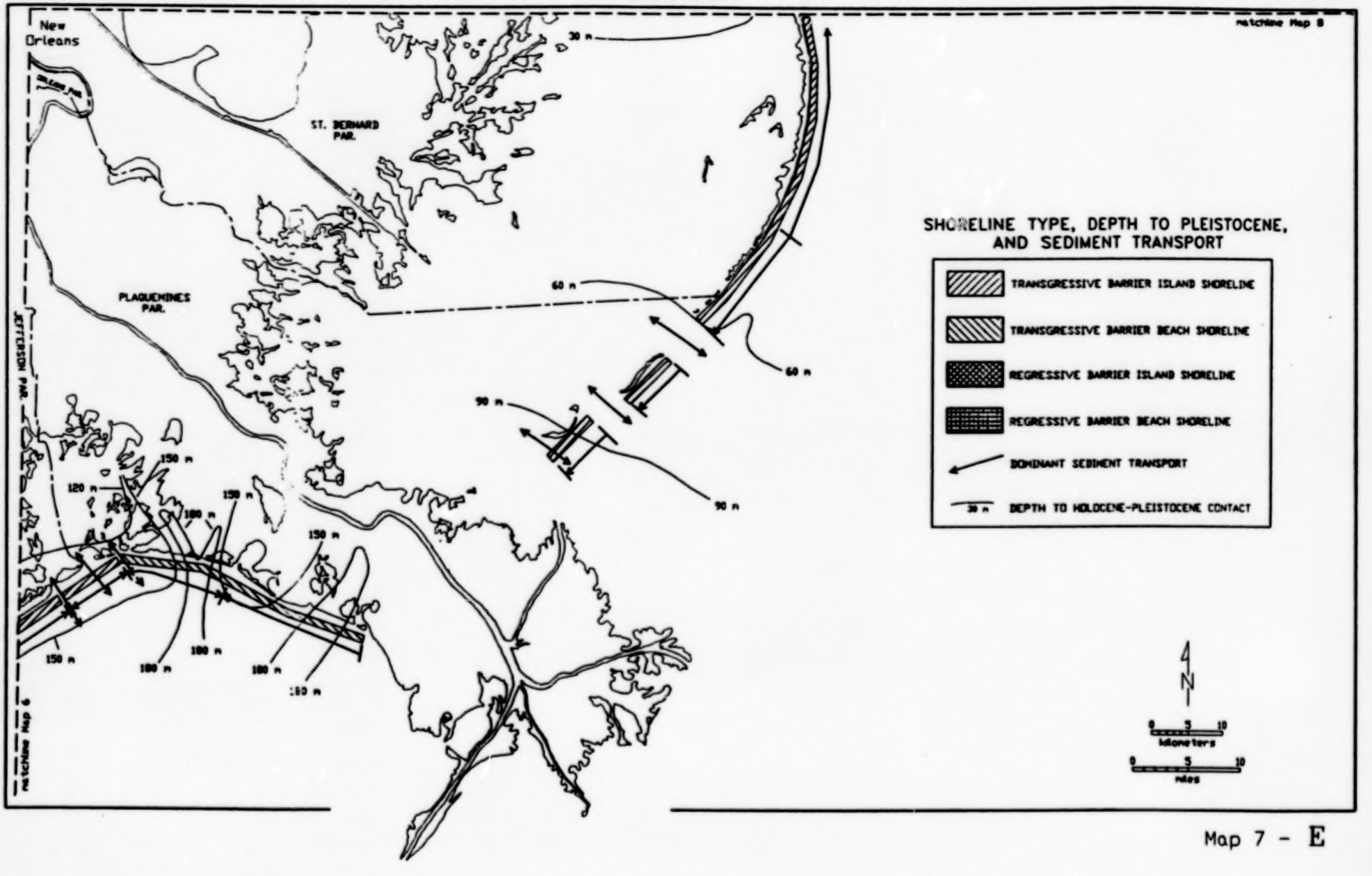


Map 5 - E

NEW ORLEANS

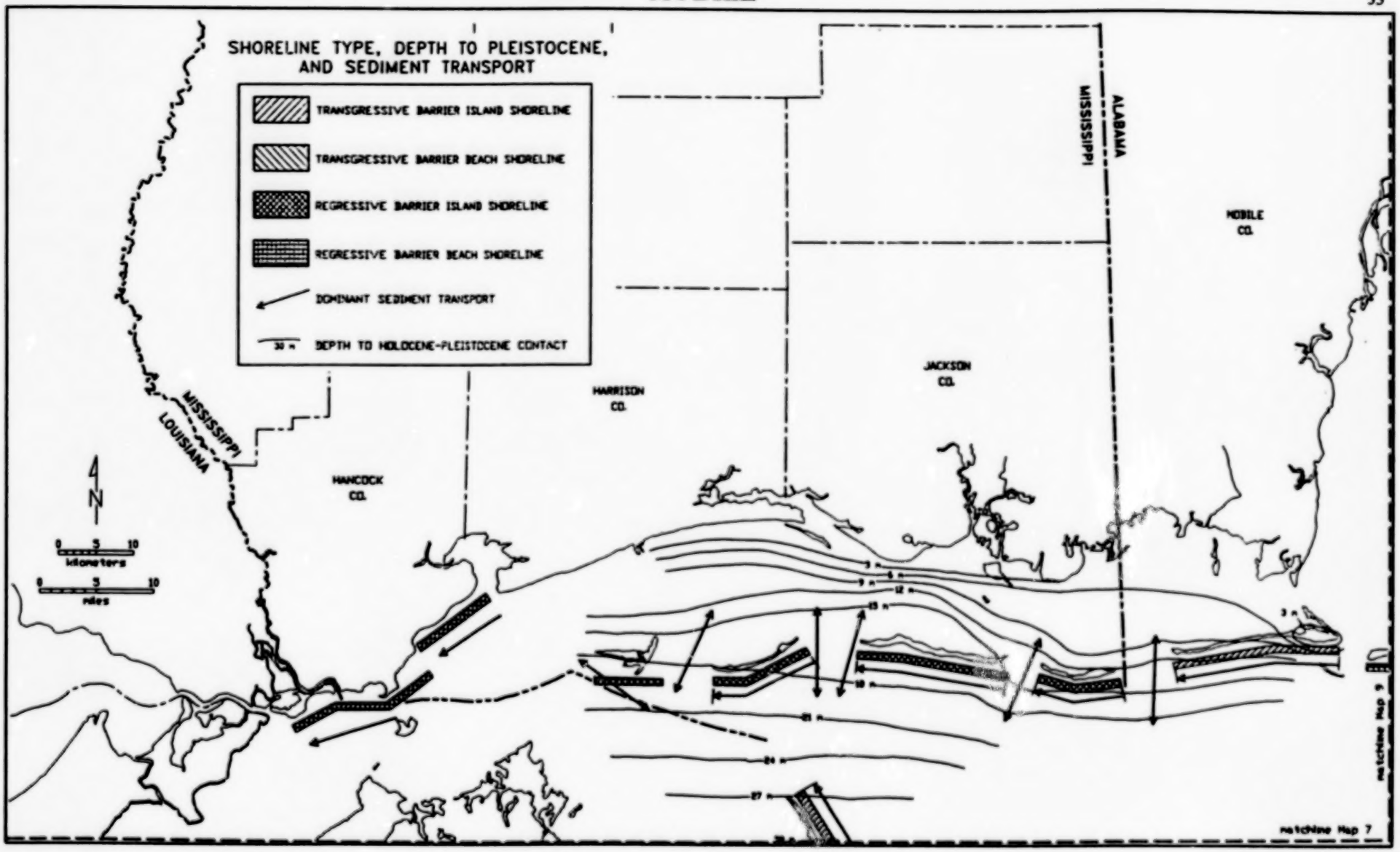


Map 6 - E


New Orleans
ST. BERNARD PAR.
PLAQUEMINES PAR.
JEFFERSON PAR.
Hatchline Map 8
Hatchline Map 6
30 m
60 m
90 m
120 m
150 m
180 m
SHORELINE TYPE, DEPTH TO PLEISTOCENE, AND SEDIMENT TRANSPORT
TRANSGRESSIVE BARRIER ISLAND SHORELINE
TRANSGRESSIVE BARRIER BEACH SHORELINE
REGRESSIVE BARRIER ISLAND SHORELINE
REGRESSIVE BARRIER BEACH SHORELINE
DOMINANT SEDIMENT TRANSPORT
30 m DEPTH TO HOLOCENE-PLEISTOCENE CONTACT
N
0 5 10
kilometers
0 5 10
miles

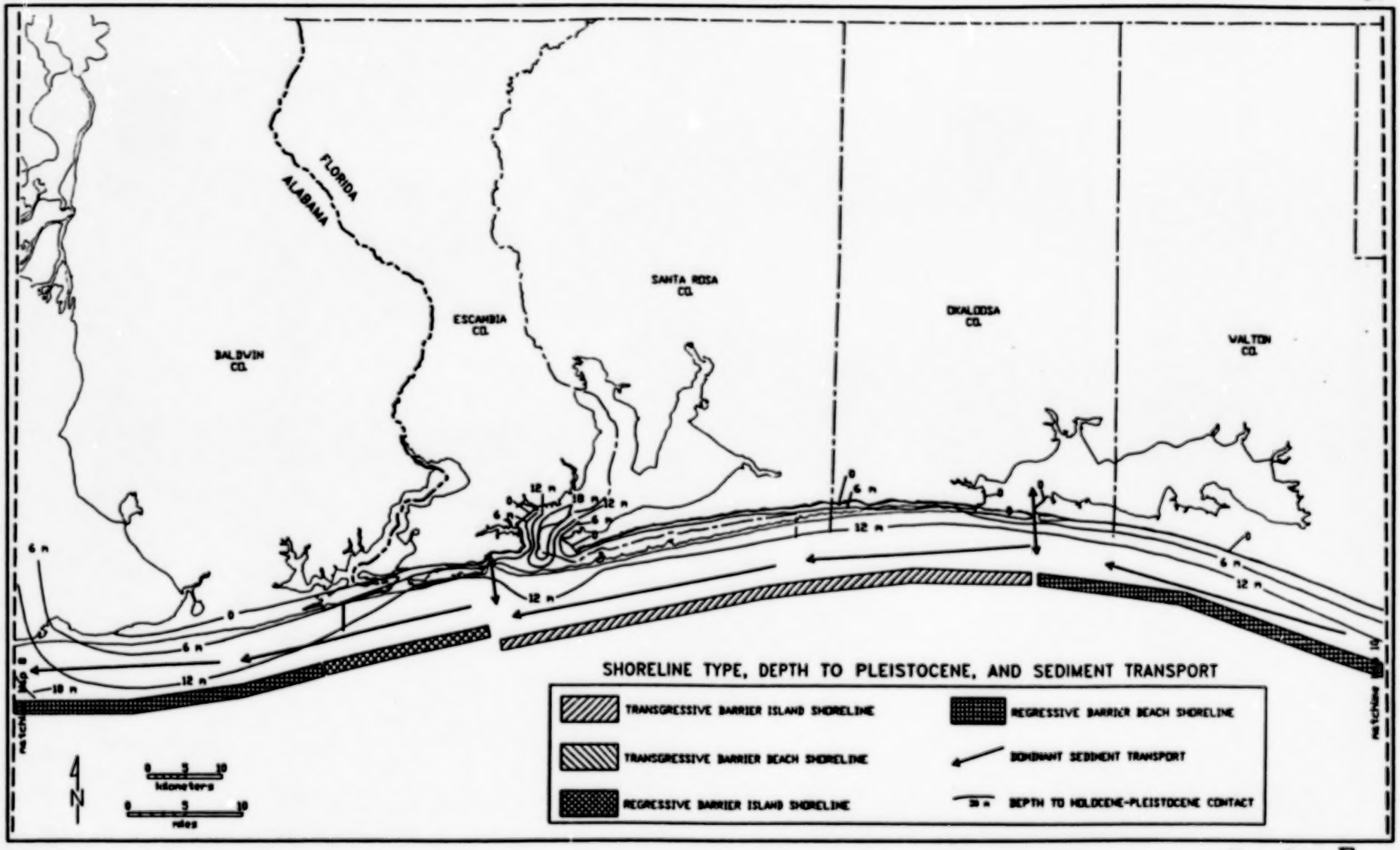
Map 7 - E

MOBILE



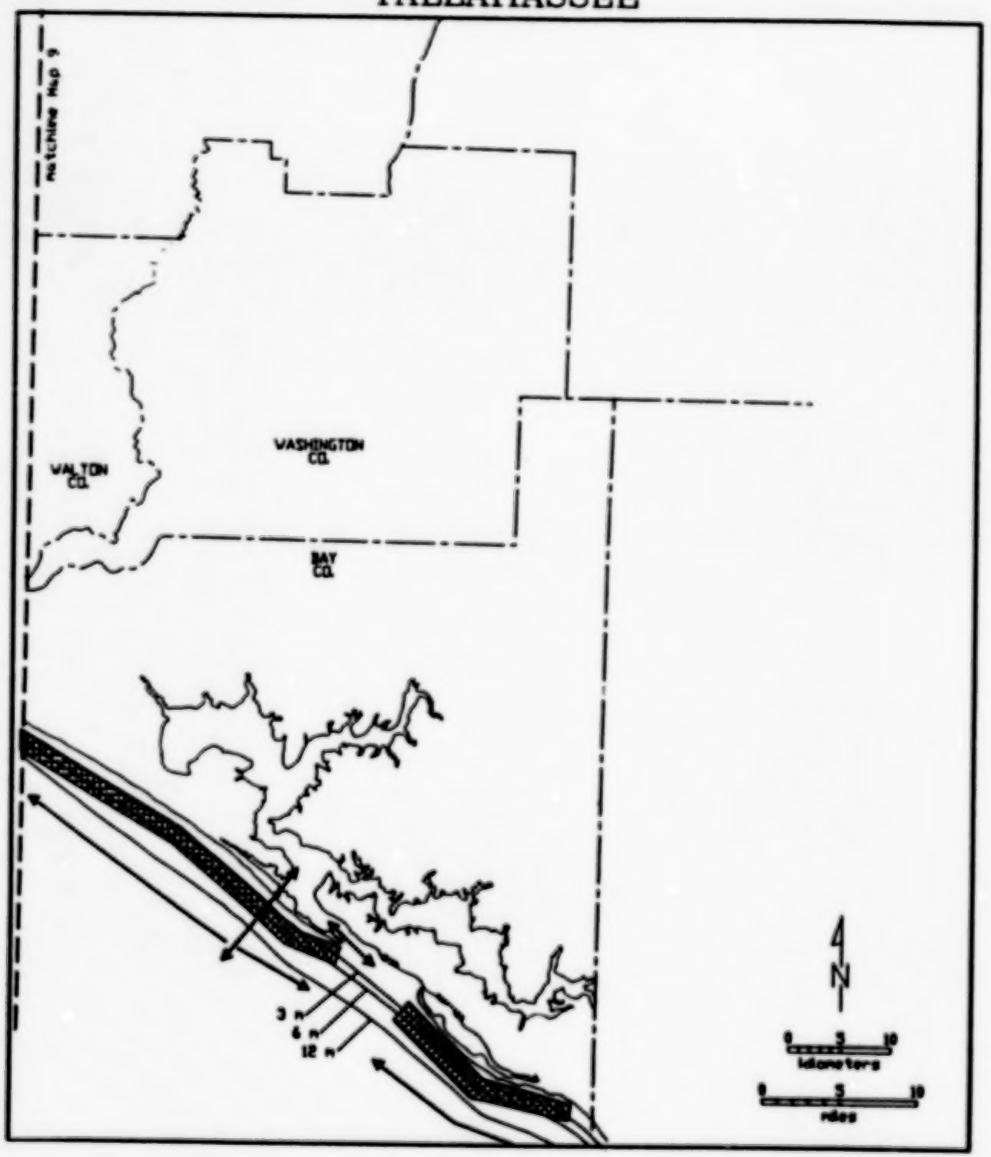
Map 8 - E

PENSACOLA



Map 9 - E

TALLAHASSEE



Map 10 - E

SHORELINE TYPE, DEPTH TO PLEISTOCENE, AND SEDIMENT TRANSPORT

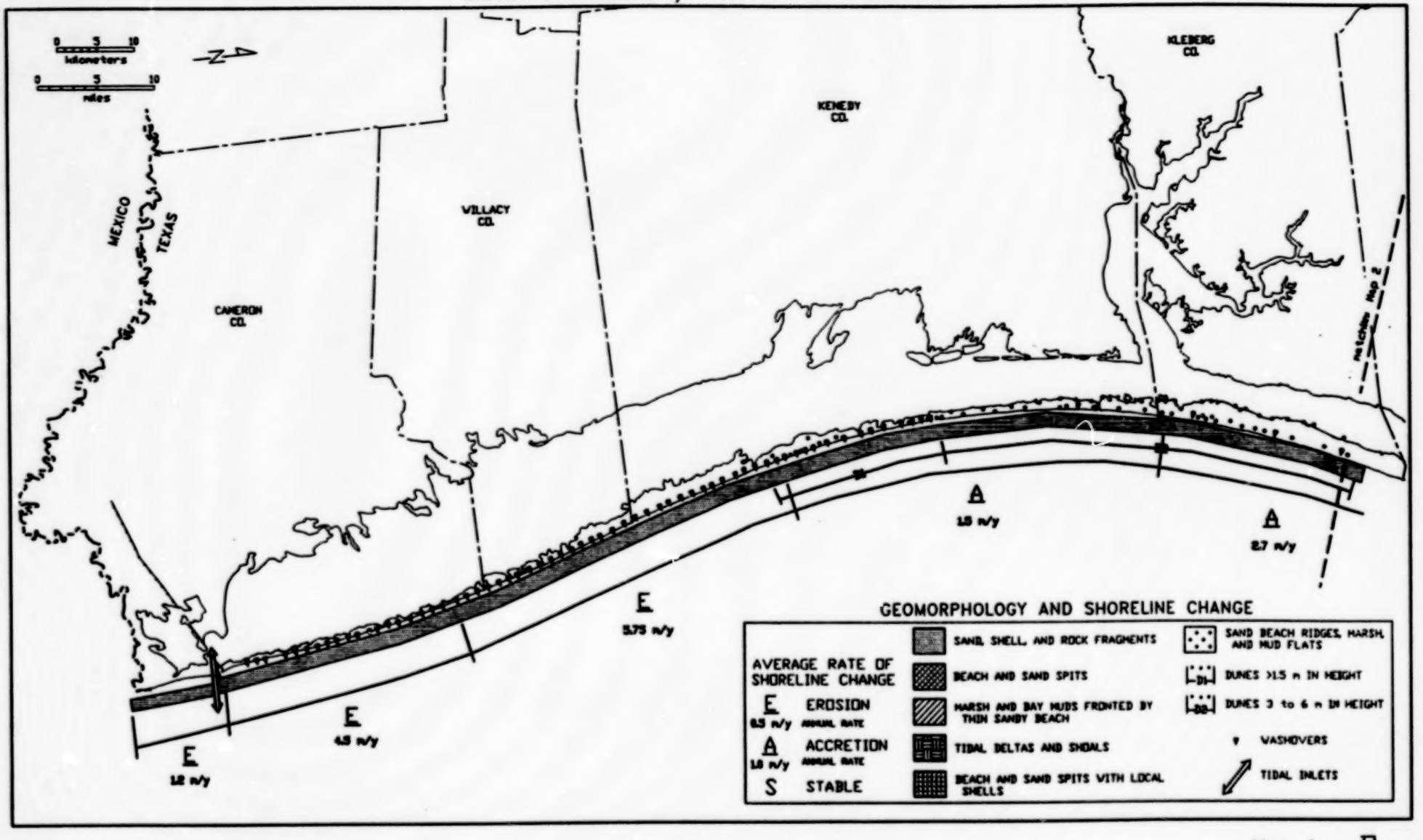
- TRANSGRESSIVE BARRIER ISLAND SHORELINE
- TRANSGRESSIVE BARRIER BEACH SHORELINE
- REGRESSIVE BARRIER ISLAND SHORELINE
- REGRESSIVE BARRIER BEACH SHORELINE
- DOMINANT SEDIMENT TRANSPORT
- 30 m DEPTH TO HOLOCENE-PLEISTOCENE CONTACT

56

Maps 1F - 10F

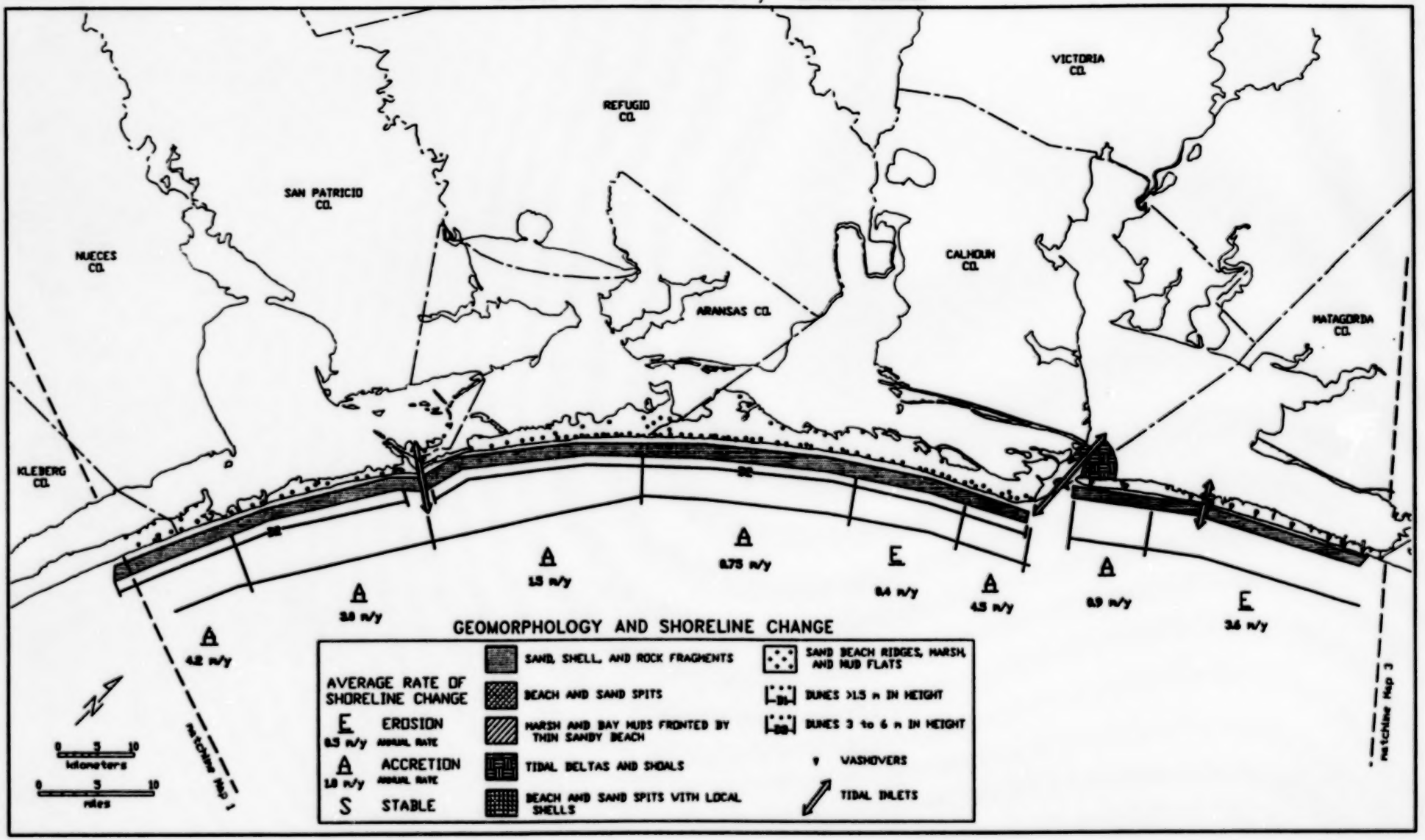
GEOMORPHOLOGY AND SHORELINE CHANGE

BROWNSVILLE / CORPUS CHRISTI



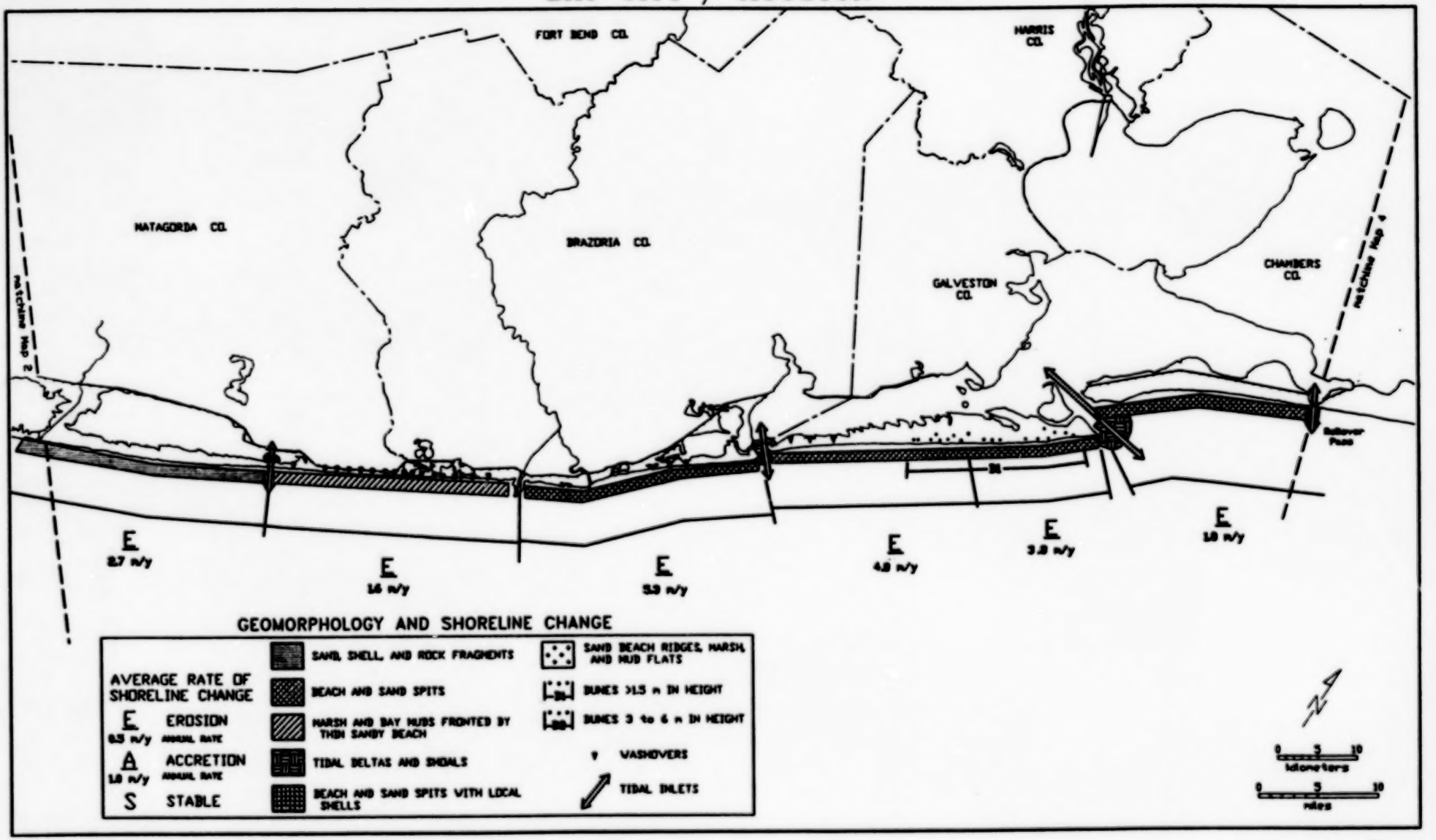
Map 1 - F

CORPUS CHRISTI / BEEVILLE



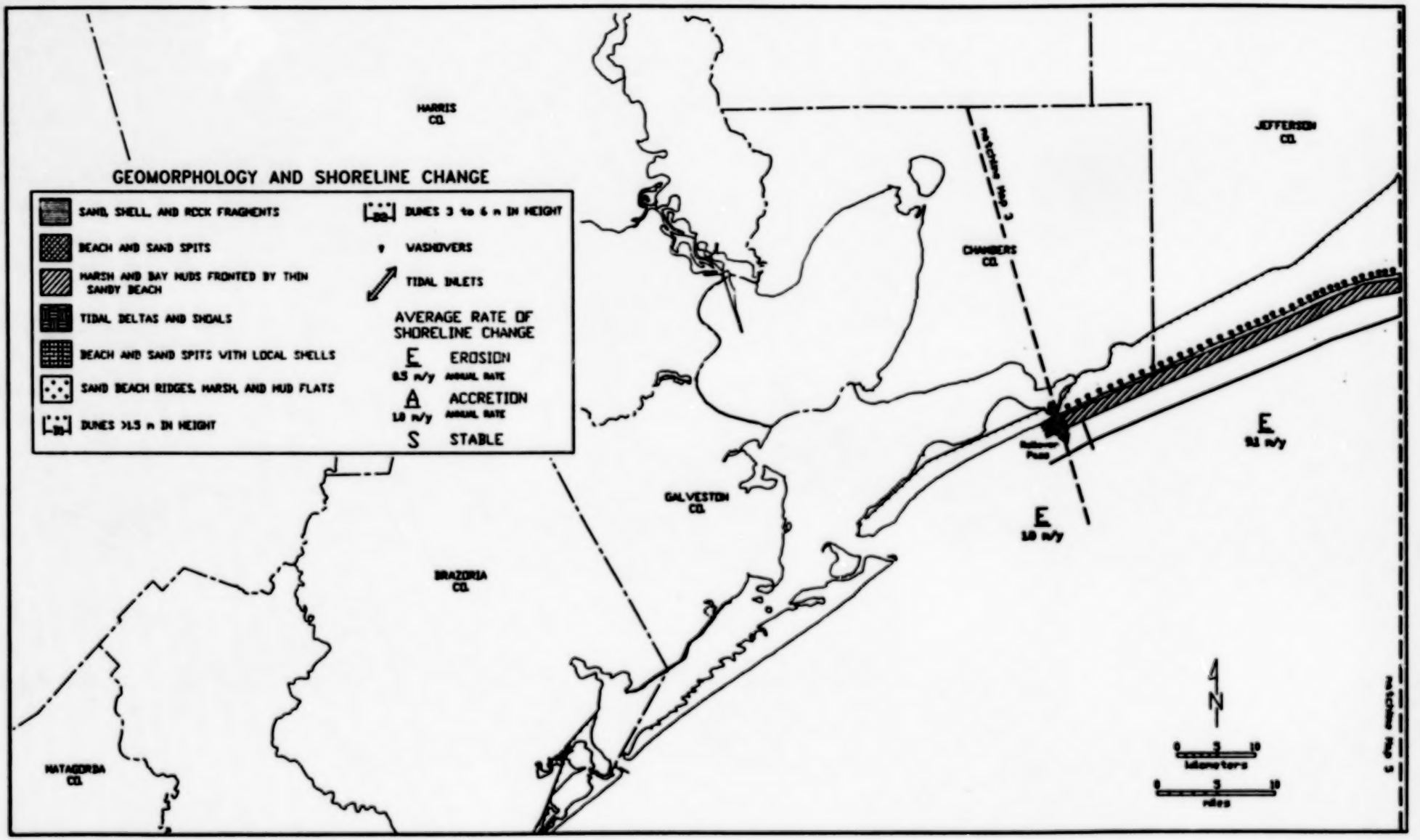
Map 2 - F

BAY CITY / HOUSTON



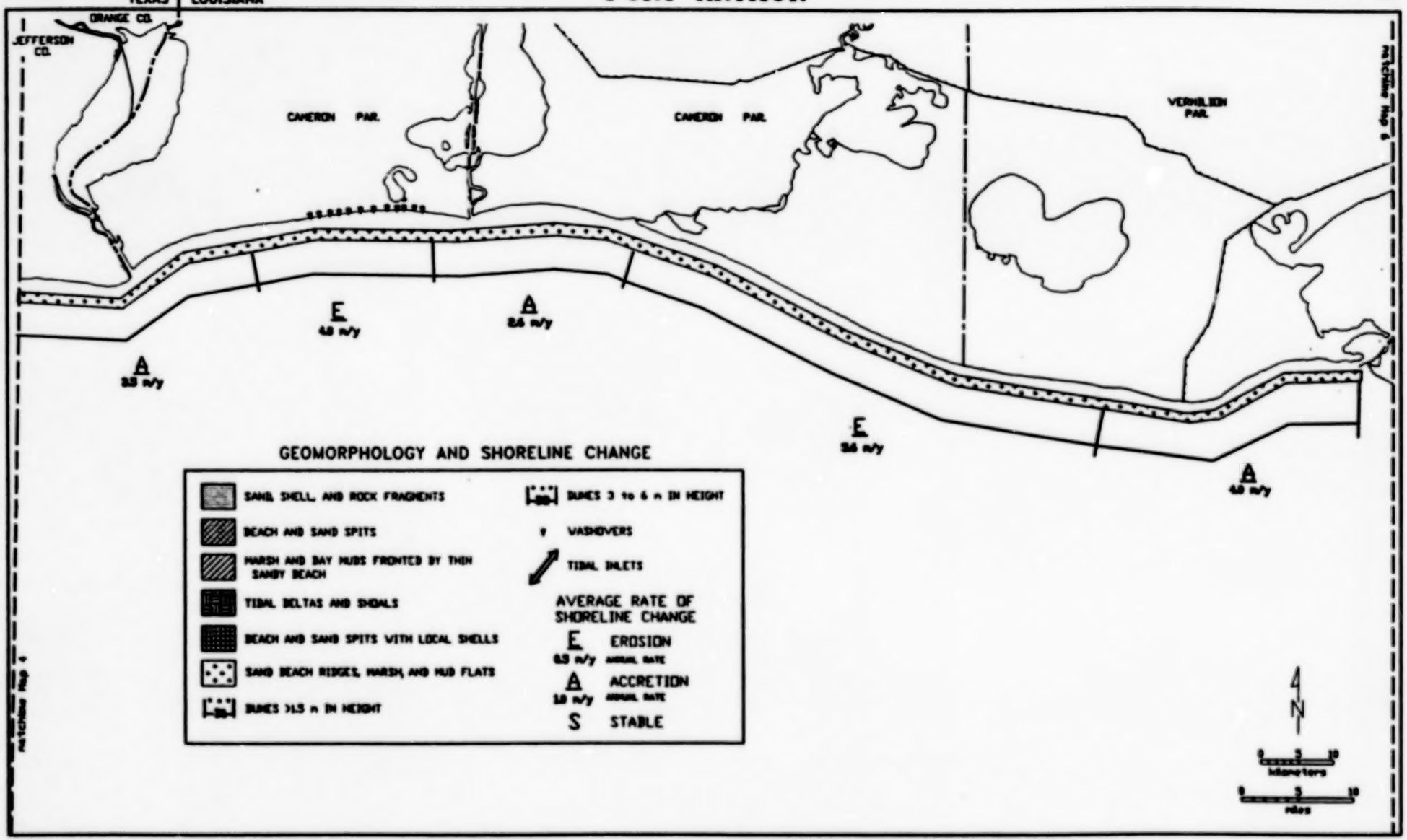
Map 3 - F

HOUSTON



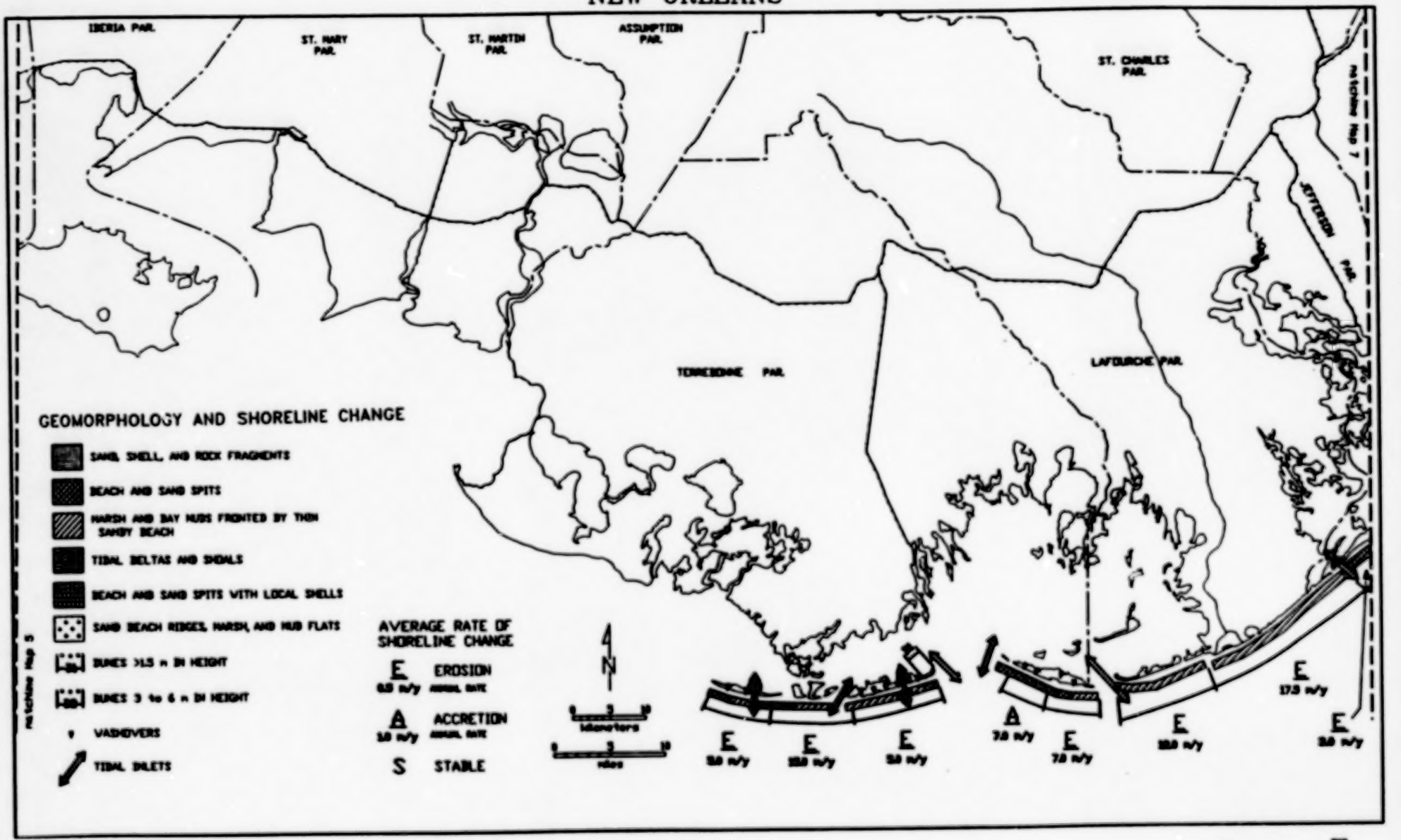
Map 4 - F

PORT ARTHUR

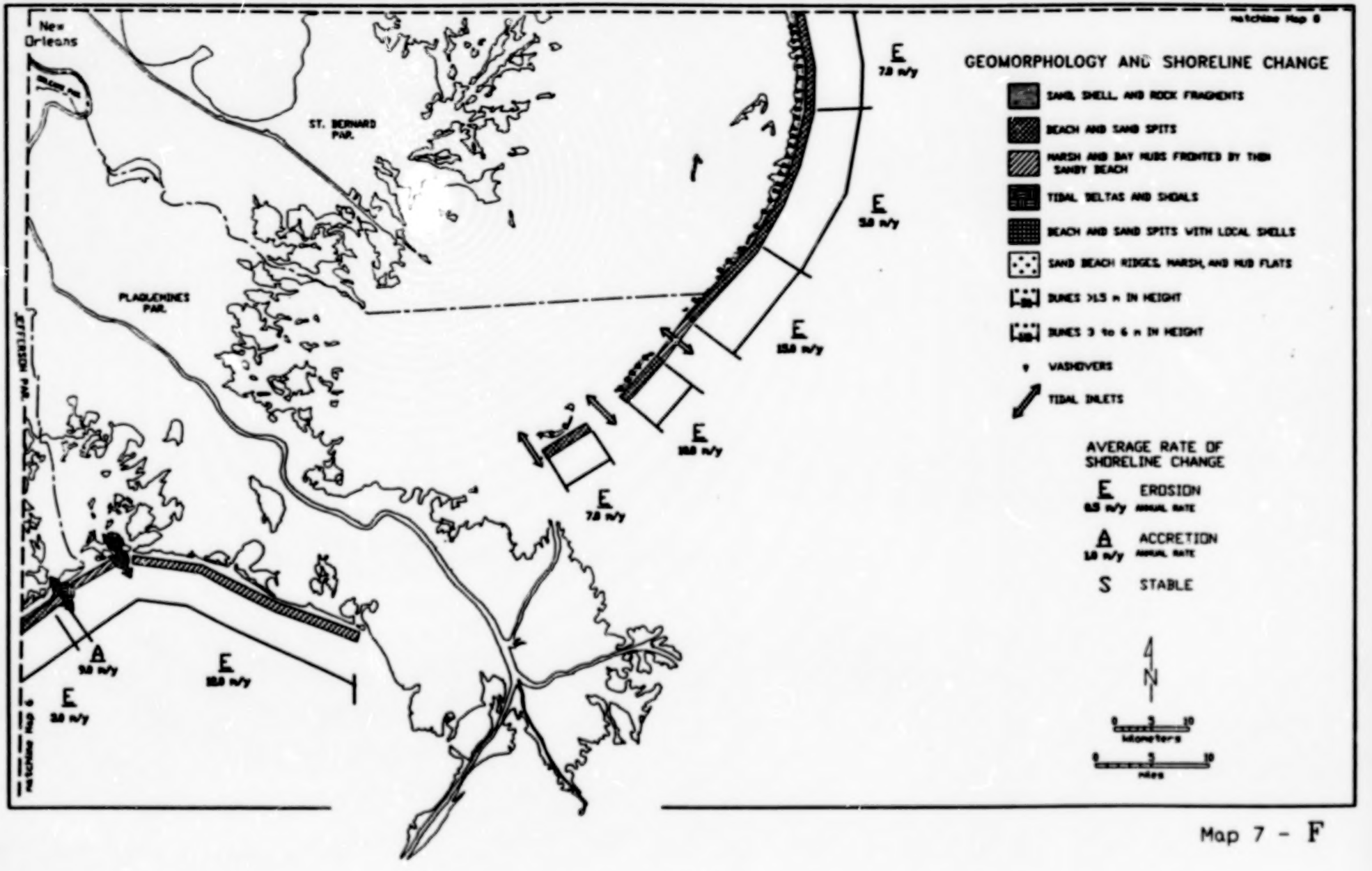


Map 5 - F

NEW ORLEANS

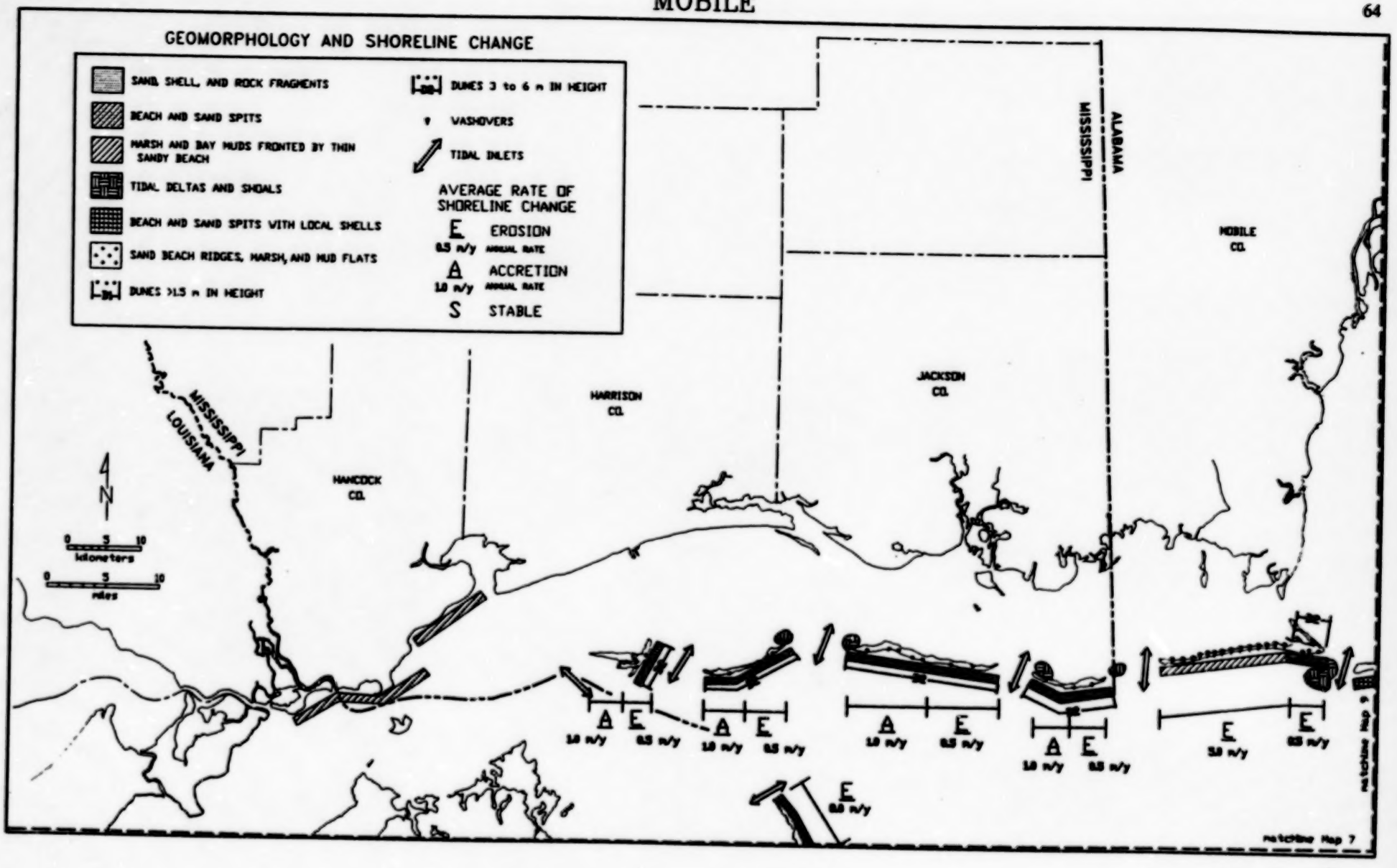


Map 6 - F

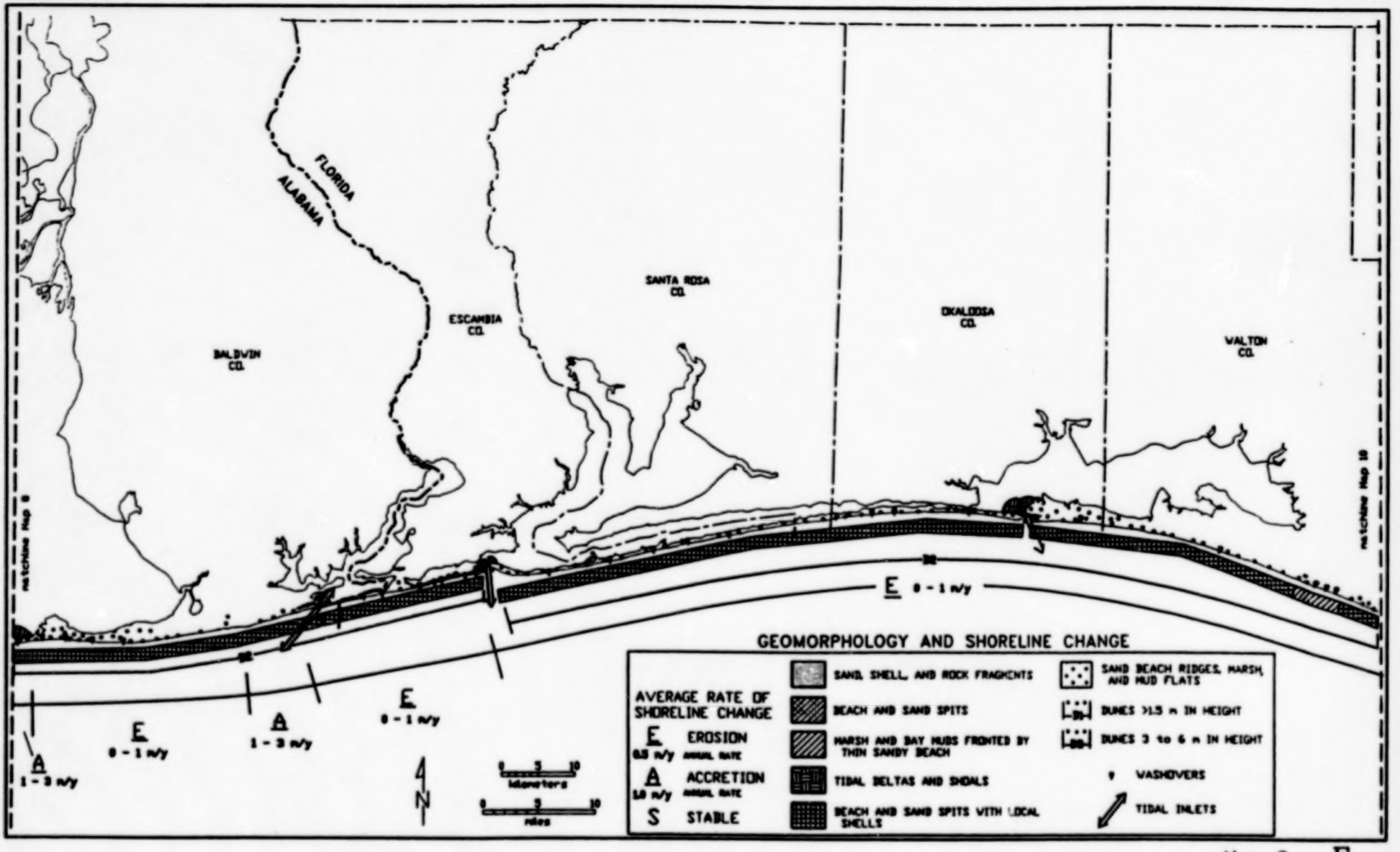

New Orleans
ST. BERNARD PAR.
PLAQUEMINES PAR.
JEFFERSON PAR.
E 7.8 m/y
E 5.0 m/y
E 15.0 m/y
E 10.0 m/y
E 7.8 m/y
A 5.0 m/y
E 15.0 m/y
E 2.0 m/y
GEOMORPHOLOGY AND SHORELINE CHANGE
SAND, SHELL, AND ROCK FRAGMENTS
BEACH AND SAND SPITS
MARSH AND BAY MUDS FRONTED BY THIN SANDY BEACH
TIDAL DELTAS AND SHOALS
BEACH AND SAND SPITS WITH LOCAL SHELLS
SAND BEACH RIDGES, MARSH, AND MUD FLATS
DUNES >1.5 m IN HEIGHT
DUNES 3 to 6 m IN HEIGHT
WASHOVERS
TIDAL INLETS
AVERAGE RATE OF SHORELINE CHANGE
E EROSION
A ACCRETION
S STABLE
N
kilometers
miles

Map 7 - F

MOBILE

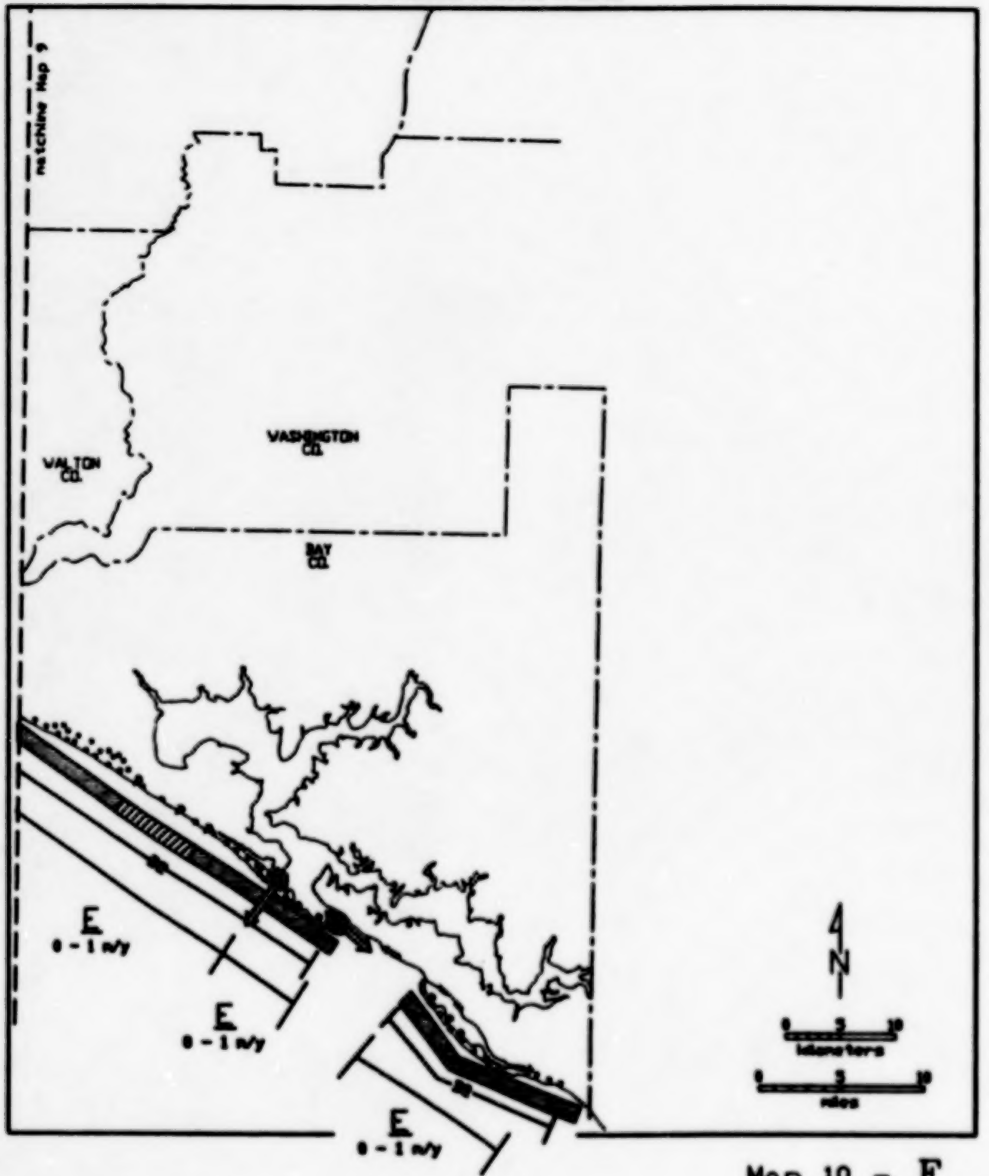


Map 8 - F


FLORIDA
ALABAMA
BALDWIN CO.
ESCAMBIA CO.
SANTA ROSA CO.
OKALOOSA CO.
WALTON CO.
E 0 - 1 m/y
E 0 - 1 m/y
A 1 - 3 m/y
E 0 - 1 m/y
A 1 - 3 m/y
0 5 10 kilometers
0 5 10 miles
N
GEOMORPHOLOGY AND SHORELINE CHANGE
AVERAGE RATE OF SHORELINE CHANGE
E EROSION 0.5 m/y ANNUAL RATE
A ACCRETION 1.0 m/y ANNUAL RATE
S STABLE
SAND, SHELL, AND ROCK FRAGMENTS
BEACH AND SAND SPITS
MARSH AND BAY MUDS FRONTED BY THIN SANDY BEACH
TIDAL DELTAS AND SHOALS
BEACH AND SAND SPITS WITH LOCAL SHELLS
SAND BEACH RIDGES, MARSH, AND MUD FLATS
DUNES >1.5 m IN HEIGHT
DUNES 3 to 6 m IN HEIGHT
WASHOVERS
TIDAL INLETS

Map 9 - F

TALLAHASSEE



Map 10 - F

GEOMORPHOLOGY AND SHORELINE CHANGE

- SAND, SHELL, AND ROCK FRAGMENTS
- BEACH AND SAND SPITS
- MARSH AND BAY MUDS FRONTED BY THIN SANDY BEACH
- TIDAL DELTAS AND SHOALS
- BEACH AND SAND SPITS WITH LOCAL SHELLS
- SAND BEACH RIDGES, MARSH, AND MUD FLATS
- DUNES >1.5 m IN HEIGHT
- DUNES 3 to 6 m IN HEIGHT
- WASHOVERS
- TIDAL INLETS

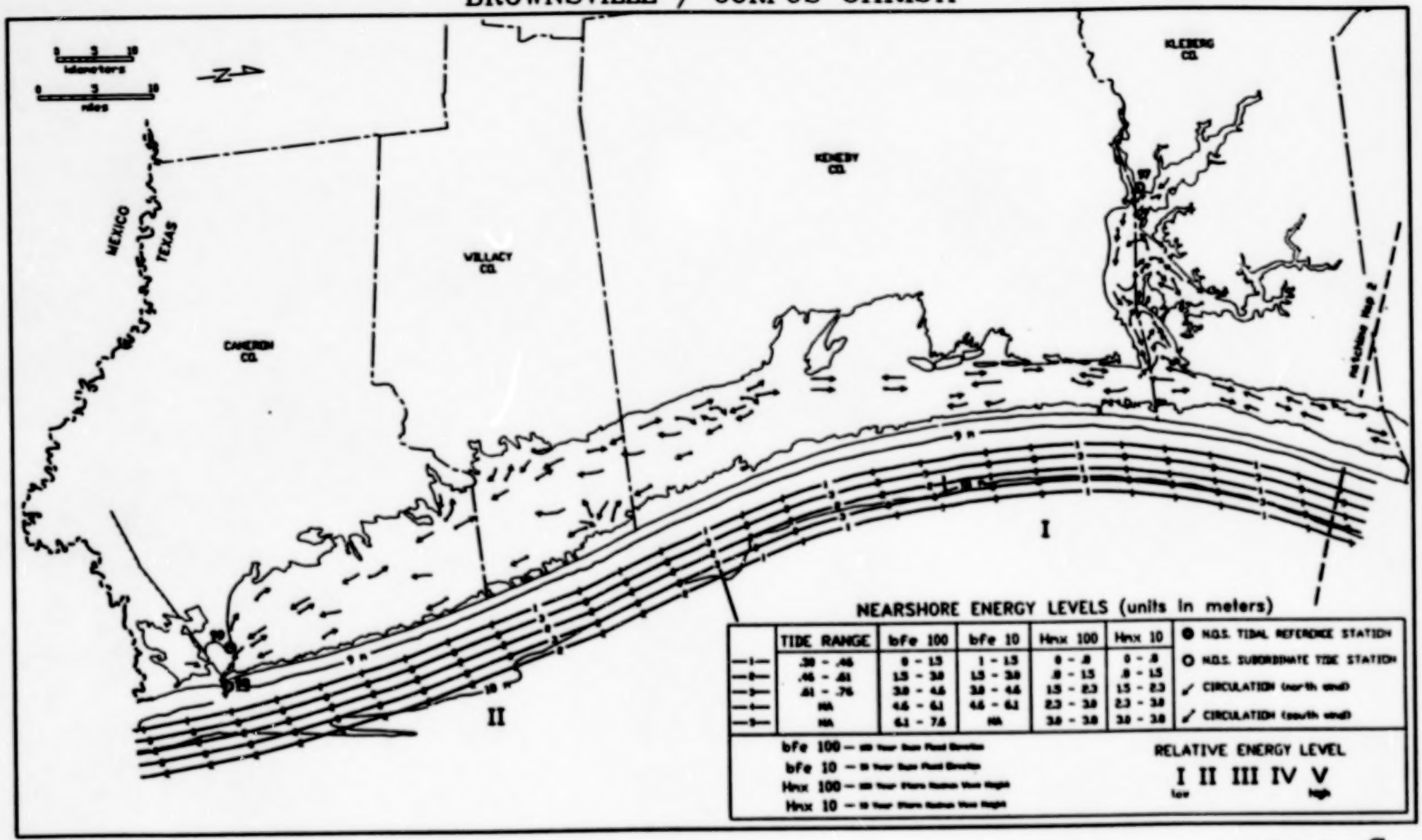
AVERAGE RATE OF SHORELINE CHANGE

- E — EROSION — 0.5 m/y ANNUAL RATE
- A — ACCRETION — 1.0 m/y ANNUAL RATE
- S — STABLE

Maps 1G - 10G

NEARSHORE ENERGY LEVELS

BROWNSVILLE / CORPUS CHRISTI



NEARSHORE ENERGY LEVELS (units in meters)

	TIDE RANGE	bfe 100	bfe 10	Hnx 100	Hnx 10
—1—	.30 - .46	0 - 1.5	1 - 1.5	0 - .8	0 - .8
—2—	.46 - .61	1.5 - 3.0	1.5 - 3.0	.8 - 1.5	.8 - 1.5
—3—	.61 - .76	3.0 - 4.6	3.0 - 4.6	1.5 - 2.3	1.5 - 2.3
—4—	NA	4.6 - 6.1	4.6 - 6.1	2.3 - 3.0	2.3 - 3.0
—5—	NA	6.1 - 7.6	NA	3.0 - 3.8	3.0 - 3.8

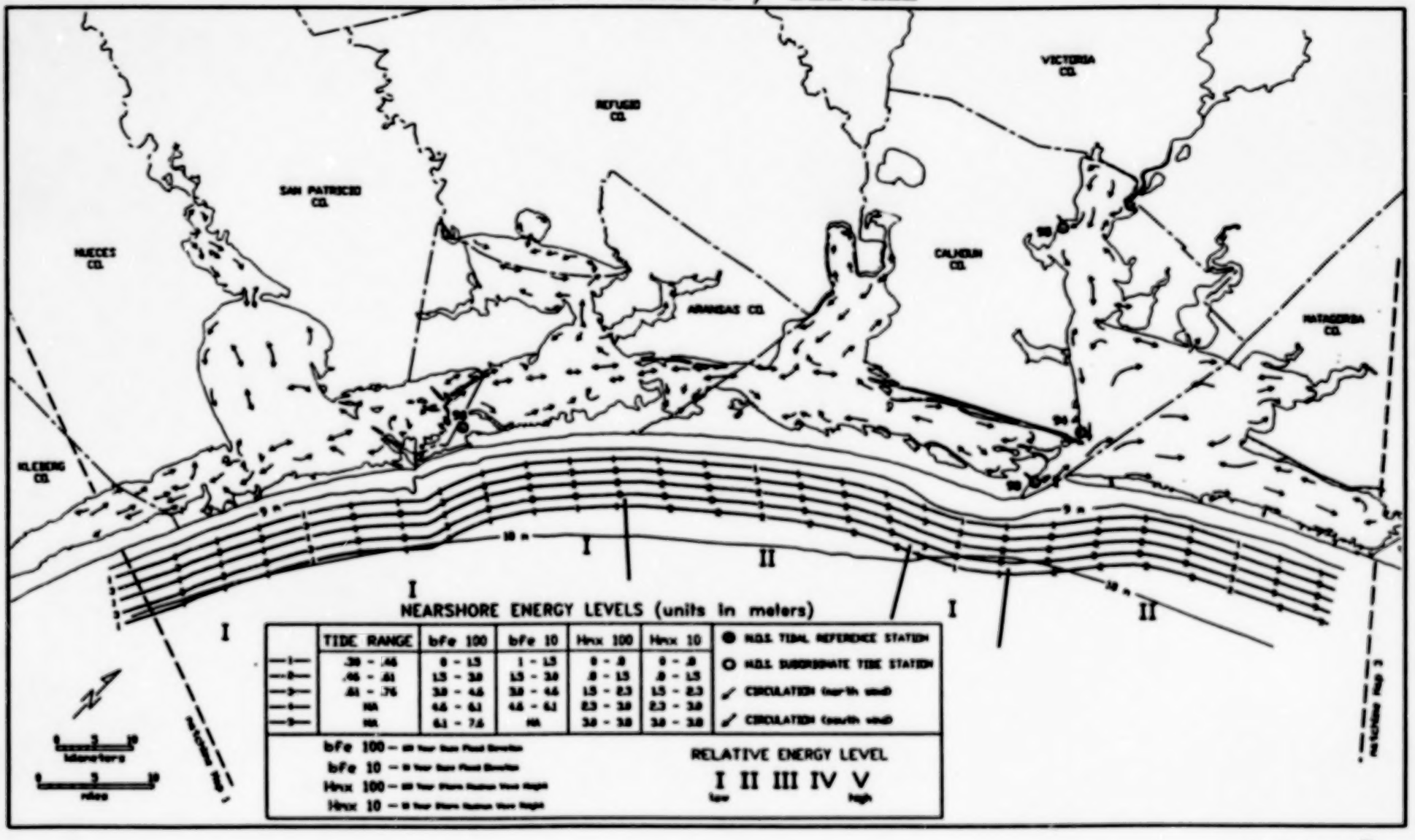
● N.O.S. TIDAL REFERENCE STATION
○ N.O.S. SUBORDINATE TIDE STATION
↙ CIRCULATION (north wind)
↙ CIRCULATION (south wind)

bfe 100 — 100 Year Base Flood Elevation
bfe 10 — 10 Year Base Flood Elevation
Hnx 100 — 100 Year Storm Nature Wave Height
Hnx 10 — 10 Year Storm Nature Wave Height

RELATIVE ENERGY LEVEL
I II III IV V
low high

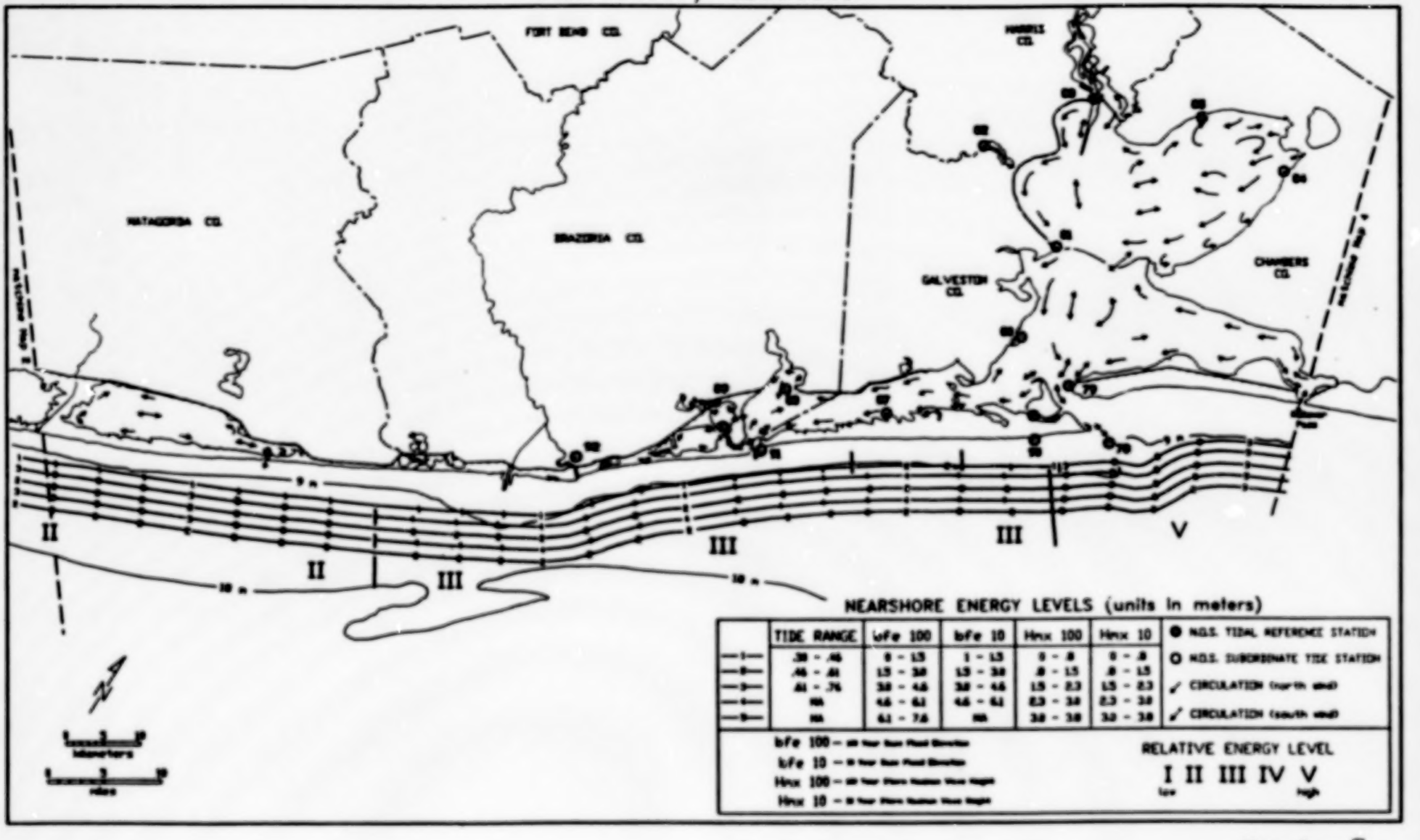
Map 1 - G

CORPUS CHRISTI / BEEVILLE



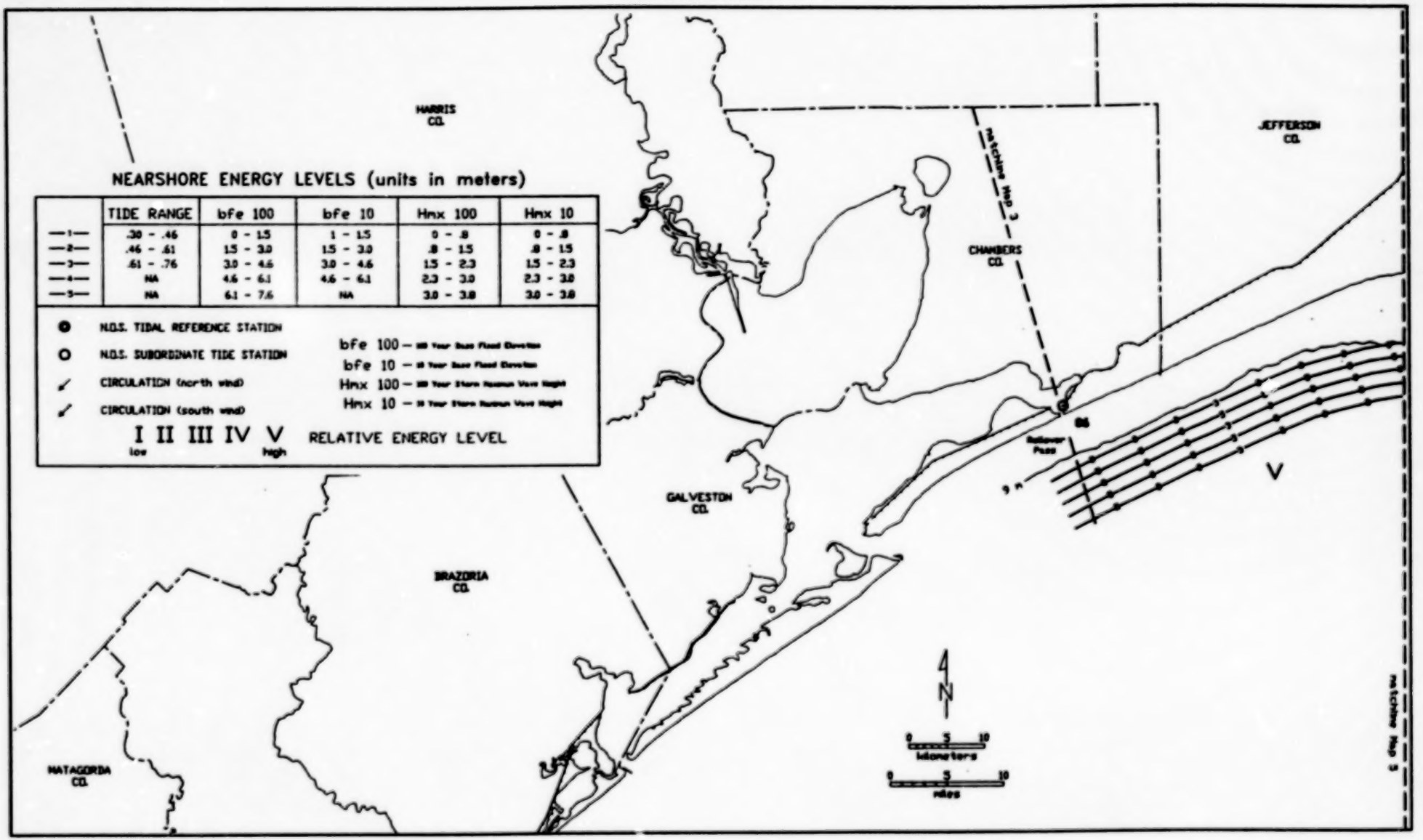
Map 2 - G

BAY CITY / HOUSTON



Map 3 - G

HOUSTON



NEARSHORE ENERGY LEVELS (units in meters)

	TIDE RANGE	bfe 100	bfe 10	Hmx 100	Hmx 10
—1—	.30 - .46	0 - 1.5	1 - 1.5	0 - .8	0 - .8
—2—	.46 - .61	1.5 - 3.0	1.5 - 3.0	.8 - 1.5	.8 - 1.5
—3—	.61 - .76	3.0 - 4.6	3.0 - 4.6	1.5 - 2.3	1.5 - 2.3
—4—	NA	4.6 - 6.1	4.6 - 6.1	2.3 - 3.0	2.3 - 3.8
—5—	NA	6.1 - 7.6	NA	3.0 - 3.8	3.0 - 3.8

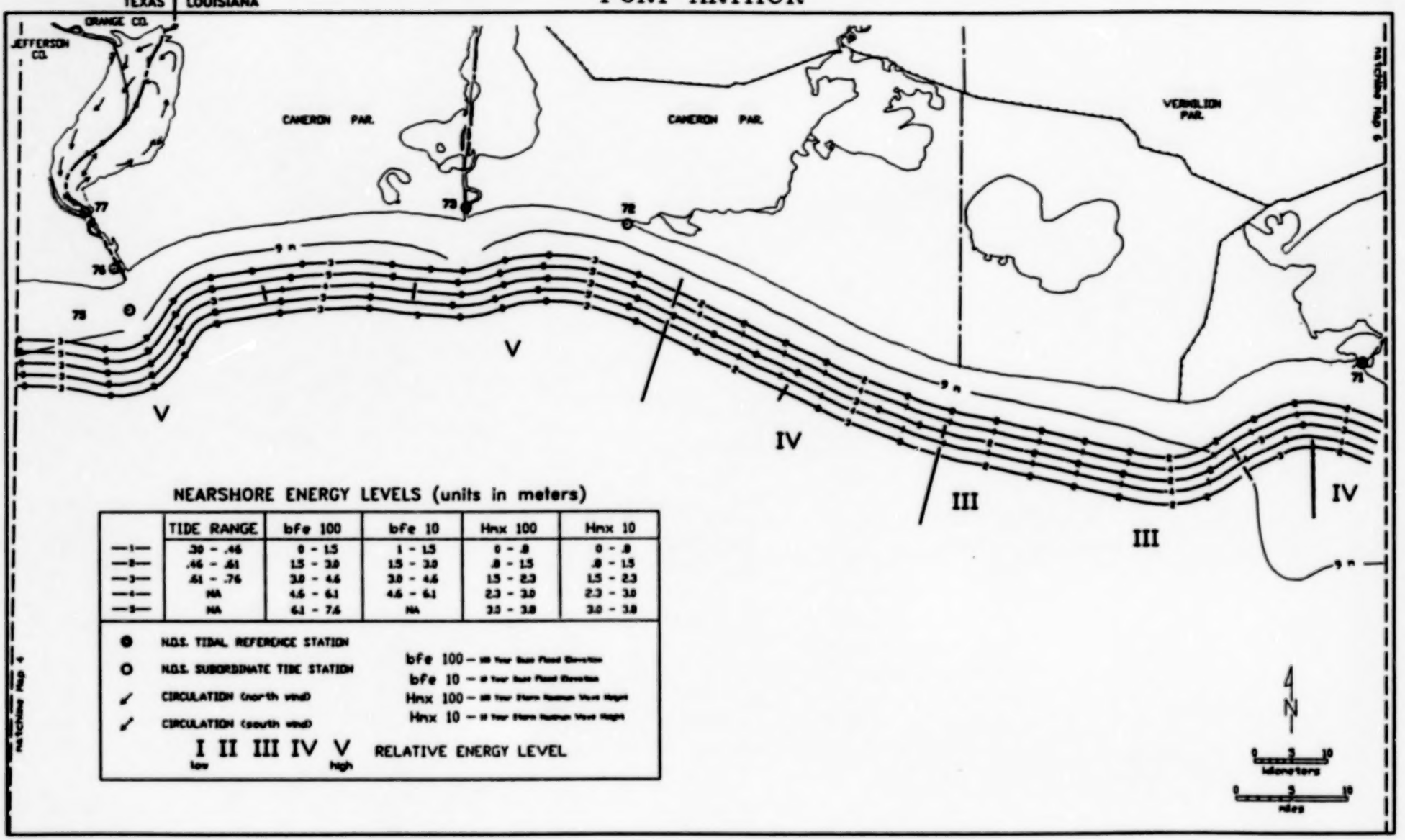
- N.O.S. TIDAL REFERENCE STATION
- N.O.S. SUBORDINATE TIDE STATION
- CIRCULATION (north wind)
- CIRCULATION (south wind)

bfe 100 — 100 Year Base Flood Elevation
bfe 10 — 10 Year Base Flood Elevation
Hmx 100 — 100 Year Storm Maximum Wave Height
Hmx 10 — 10 Year Storm Maximum Wave Height

I II III IV V RELATIVE ENERGY LEVEL
low high

Map 4 - G

PORT ARTHUR



NEARSHORE ENERGY LEVELS (units in meters)

	TIDE RANGE	bfe 100	bfe 10	Hnx 100	Hnx 10
—1—	.30 - .46	0 - 1.5	1 - 1.5	0 - .8	0 - .8
—2—	.46 - .61	1.5 - 3.0	1.5 - 3.0	.8 - 1.5	.8 - 1.5
—3—	.61 - .76	3.0 - 4.6	3.0 - 4.6	1.5 - 2.3	1.5 - 2.3
—4—	NA	4.6 - 6.1	4.6 - 6.1	2.3 - 3.0	2.3 - 3.0
—5—	NA	6.1 - 7.6	NA	3.0 - 3.8	3.0 - 3.8

● N.O.S. TIDAL REFERENCE STATION

○ N.O.S. SUBORDINATE TIDE STATION

↙ CIRCULATION (north wind)

↙ CIRCULATION (south wind)

bfe 100 — 100 Year Base Flood Elevation

bfe 10 — 10 Year Base Flood Elevation

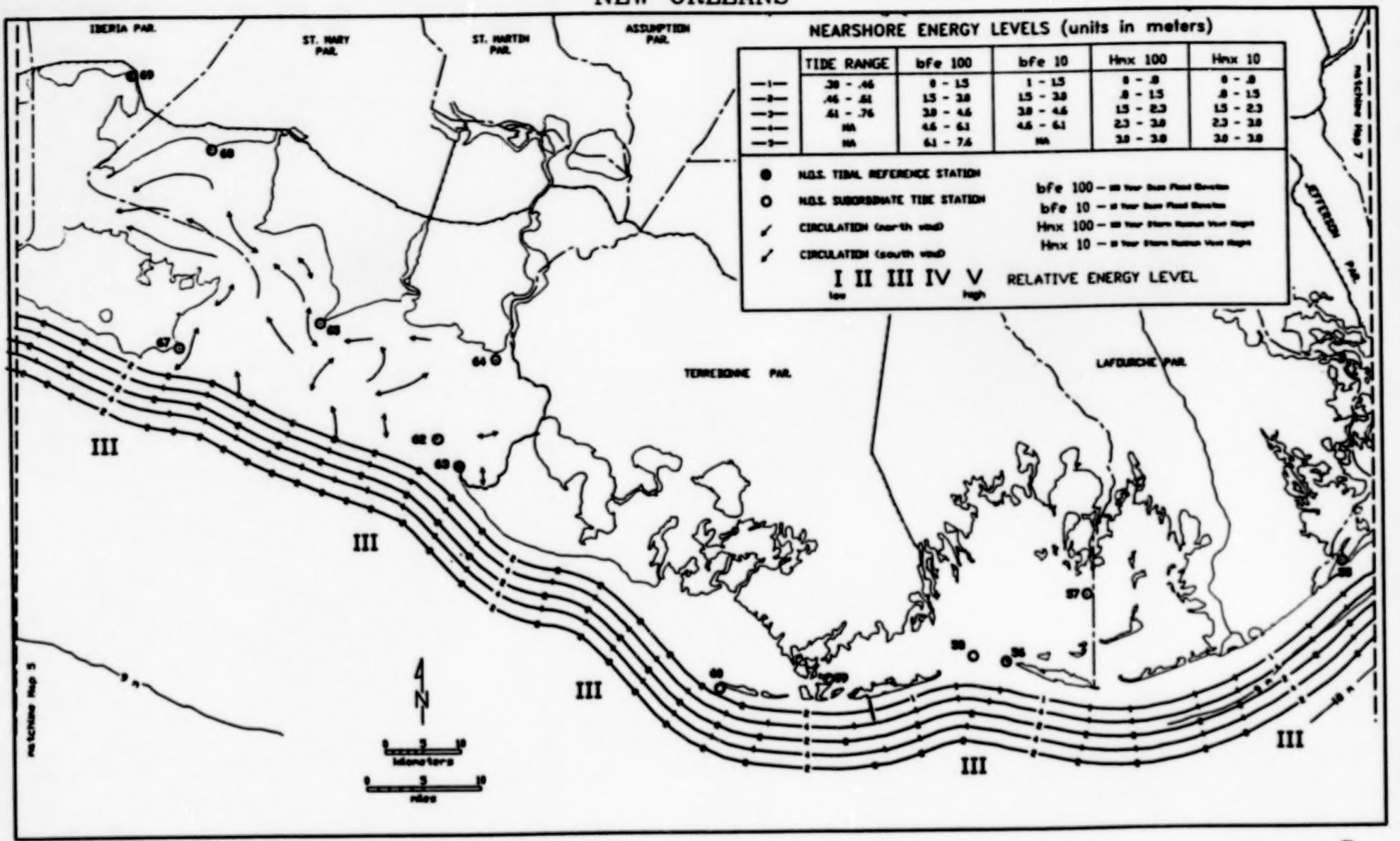
Hnx 100 — 100 Year Storm Maximum Wave Height

Hnx 10 — 10 Year Storm Maximum Wave Height

I II III IV V RELATIVE ENERGY LEVEL
low high

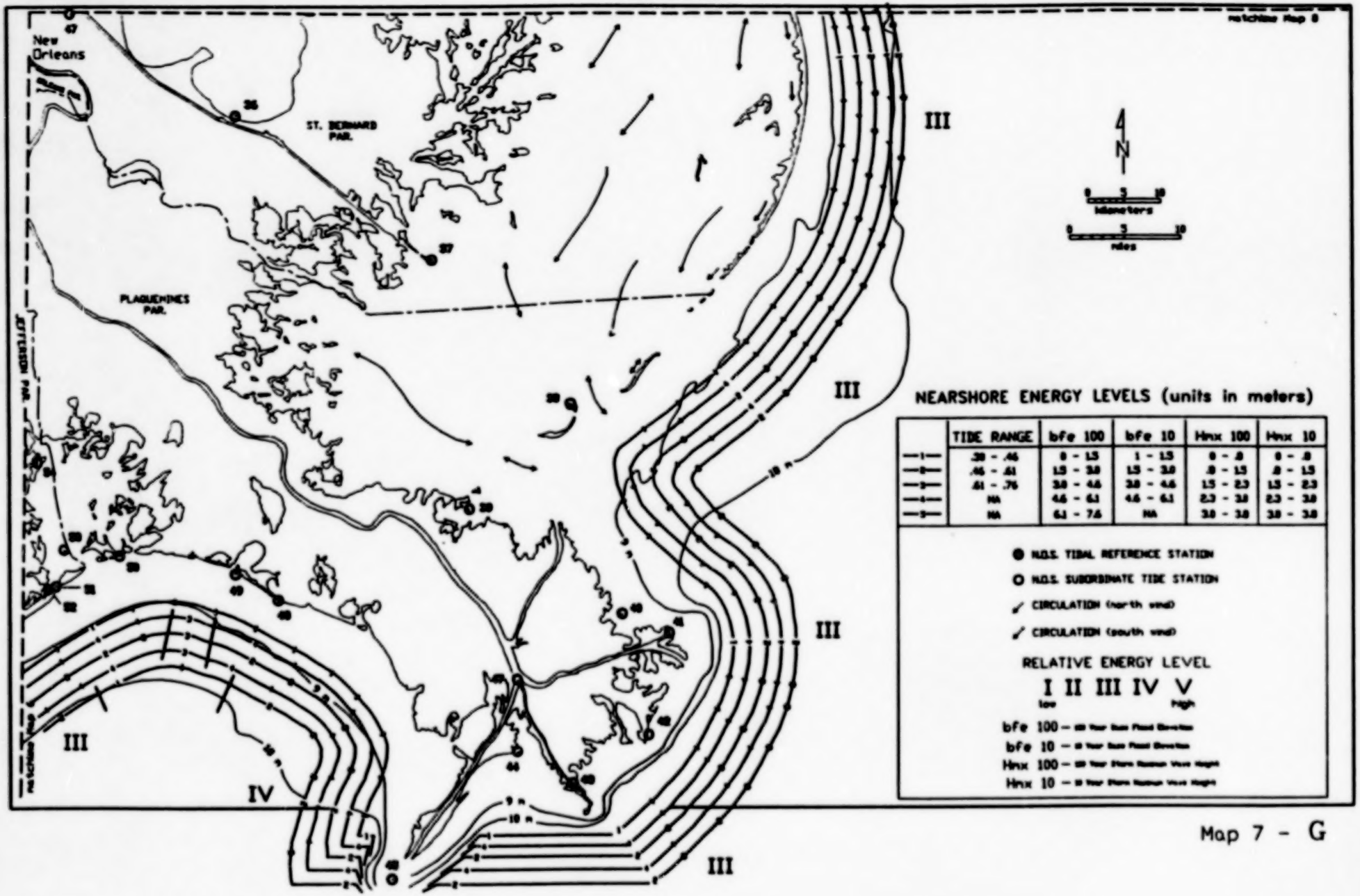
Map 5 - G

NEW ORLEANS


IBERIA PAR.
ST. MARY PAR.
ST. MARTIN PAR.
ASSUMPTION PAR.
TERREBONNE PAR.
LAFOURCHE PAR.
JEFFERSON PAR.
PATCHING Map 5
PATCHING Map 7
NEARSHORE ENERGY LEVELS (units in meters)
TIDE RANGE
bfe 100
bfe 10
Hmx 100
Hmx 10
—1— .30 - .46 0 - 1.5 1 - 1.5 0 - .8 0 - .8
—2— .46 - .61 1.5 - 3.8 1.5 - 3.8 .8 - 1.5 .8 - 1.5
—3— .61 - .76 3.8 - 4.6 3.8 - 4.6 1.5 - 2.3 1.5 - 2.3
—4— NA 4.6 - 6.1 4.6 - 6.1 2.3 - 3.8 2.3 - 3.8
—5— NA 6.1 - 7.6 NA 3.8 - 3.8 3.8 - 3.8
N.O.S. TIDAL REFERENCE STATION
N.O.S. SUBORDINATE TIDE STATION
CIRCULATION (north vand)
CIRCULATION (south vand)
bfe 100 — 100 Year Base Flood Elevation
bfe 10 — 10 Year Base Flood Elevation
Hmx 100 — 100 Year Storm Surface Wave Height
Hmx 10 — 10 Year Storm Surface Wave Height
I II III IV V
low
high
RELATIVE ENERGY LEVEL
III
III
III
III
III
N
0 5 10
kilometers
0 5 10
miles

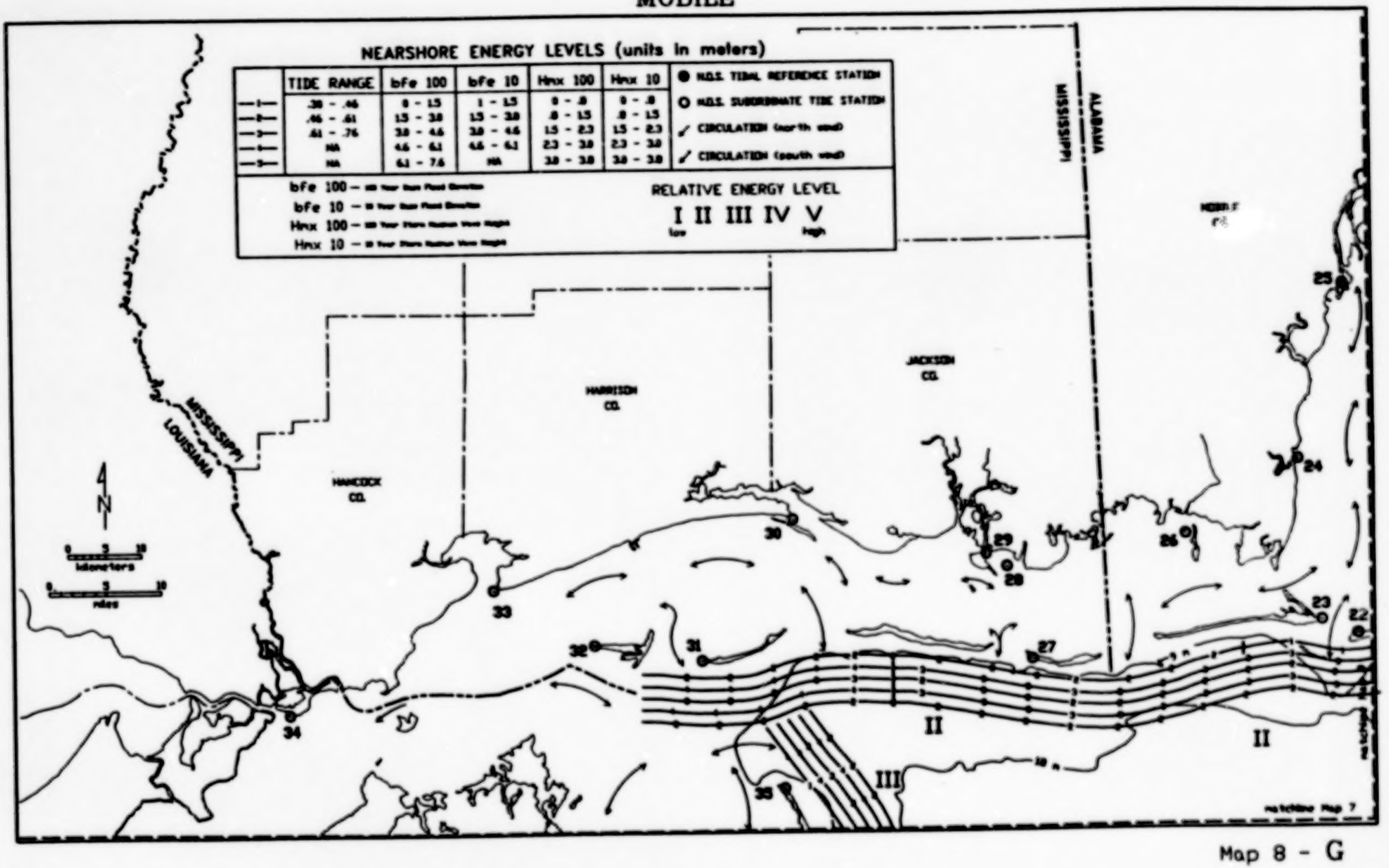
Map 6 - G

BRETON



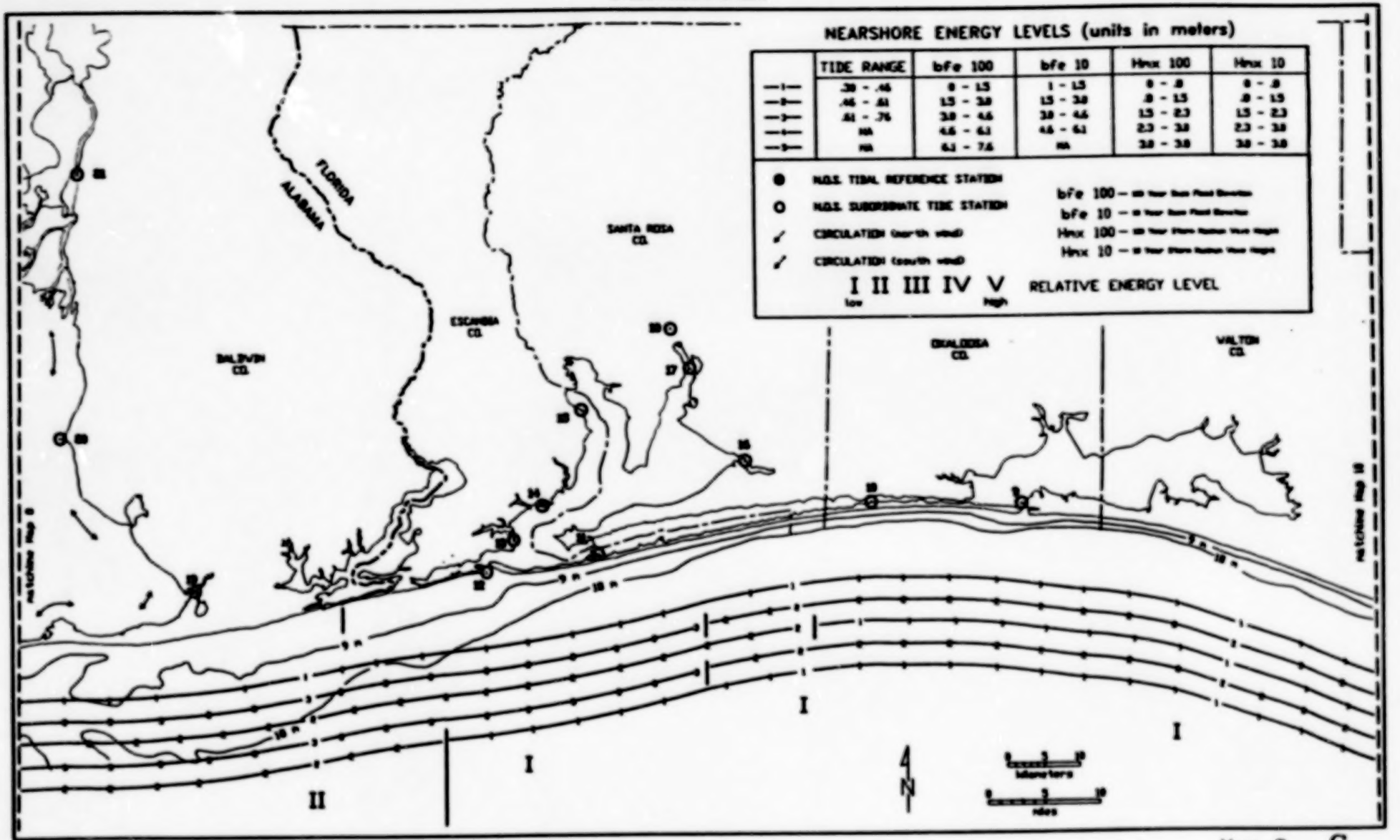
Map 7 - G

MOBILE



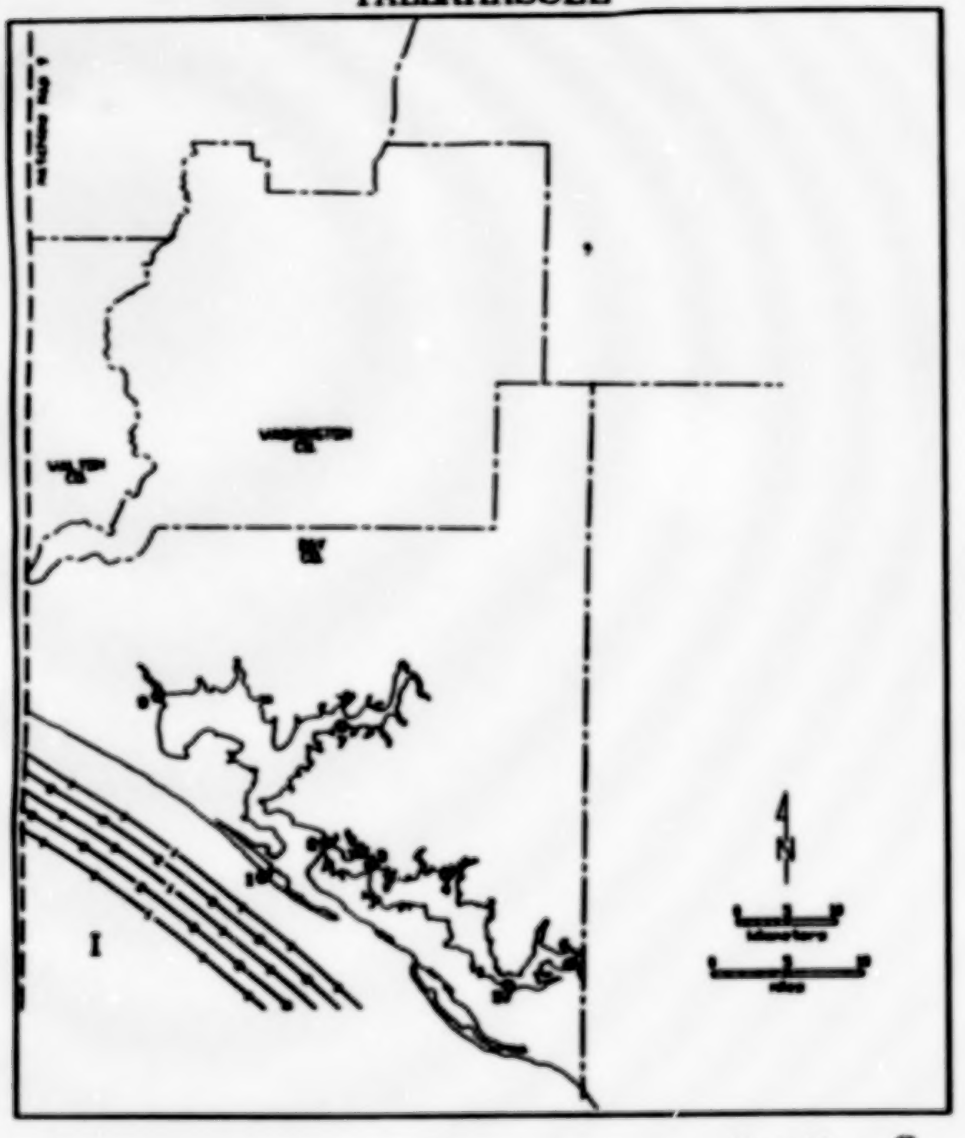
Map 8 - G

PENSACOLA



Map 9 - G

TALLAHASSEE



Map 10 - G

NEARSHORE ENERGY LEVELS (units in meters)

	TIDE RANGE	bfw 100	bfw 10	Hmax 100	Hmax 10
—+—	.20 - .45	0 - 1.5	1 - 1.5	0 - .8	0 - .8
—+—	.46 - .81	1.5 - 3.0	1.5 - 3.0	.8 - 1.5	.8 - 1.5
—+—	.81 - .76	3.0 - 4.6	3.0 - 4.6	1.5 - 2.3	1.5 - 2.3
—+—	na	4.6 - 6.1	4.6 - 6.1	2.3 - 3.0	2.3 - 3.0
—+—	na	6.1 - 7.6	na	3.0 - 3.0	3.0 - 3.0

● N.O.S. TIDAL REFERENCE STATION

○ N.O.S. SUBORDINATE TIDE STATION

CIRCULATION (north wind)

CIRCULATION (south wind)

bfw 100 — 100 Year Wave Breaking Elevation

bfw 10 — 10 Year Wave Breaking Elevation

Hmax 100 — 100 Year Offshore Maximum Wave Height

Hmax 10 — 10 Year Offshore Maximum Wave Height

I II III IV V RELATIVE ENERGY LEVEL
low high

END

11-7-91